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THE IRON TRADE REVIEW

A Weekly Journal Devoted to the Machinery, Metal-Working and Foundry Trades, and Iron and Steel Manufacture.

VOLUME XXXVII CLEVELAND, OHIO, DECEMBER 22, 1904 NUMBER 51

REPUBLIC IRON & STEEL COMPANY

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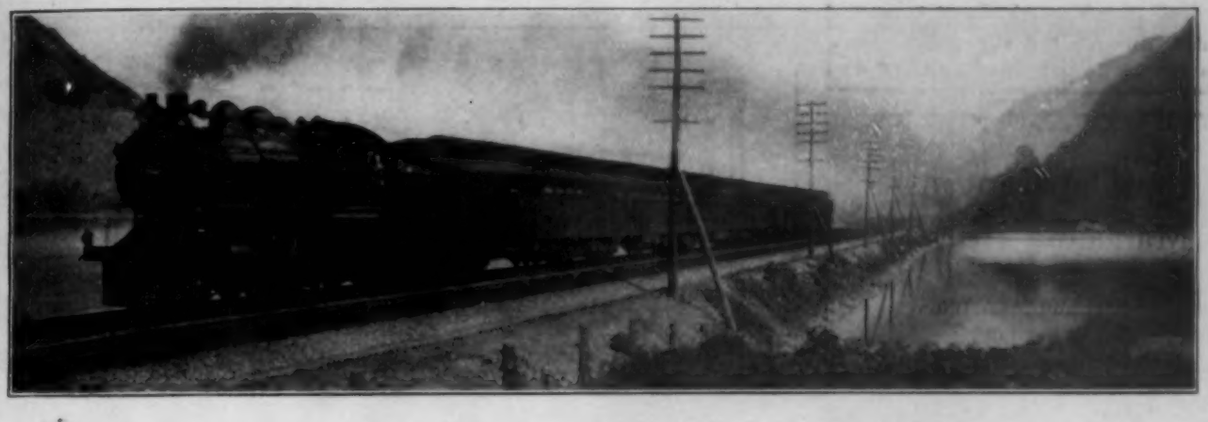

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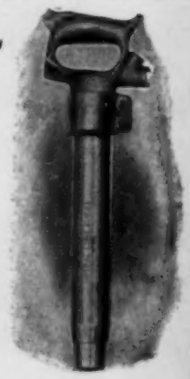


THE IRON TRADE REVIEW

VOLUME XXXVII CLEVELAND, OHIO, DECEMBER 22, 1904 NUMBER 51

THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

The tightening effect of the water famine in Western Pennsylvania upon all iron and steel operations and the price advances made by the various associations in finished steel lines are the important developments of the week. Lack of water has cut down coke production in the Connellesville region materially and the banking of a few furnaces already reported is but the beginning of the curtailment that must result if relief does not come. Boiler troubles due to the high sulphur content of the low rivers about Pittsburg have already caused serious impairment of steel works and railroad equipment. Advancing coke prices are an immediate result of the water scarcity, and as intimated in this column some time ago, fuel supply promises to be one of the most important elements in the iron situation for months. Pig iron production would have increased more rapidly but for the limitations on coke production.

Association meetings in New York this week had practically the expected outcome as to plates, shapes and steel bars—an advance of $2 a ton in all, with the exceptions that open-hearth bars advance but $1 a ton and are now on a parity with Bessemer bars and that plates between 14 and 24 in. wide were put up $4 a ton. The pendency of higher prices for these products has facilitated the booking of business recently, and a heavy tonnage has gone upon the books of steel manufacturers in the past week. The mills have attempted to discriminate between legitimate demand and buying that has a considerable element of speculation in it. Experience in previous upward movements has been that there was much precautionary covering, resulting in the buyer making profits, instead of the manufacturer, as the advance continued, and when the turn came and prices went off the buyer at high prices refused to specify. Producers are very much disposed to get the profit on the advances that are looked for in 1905, yet there is already evidence that many orders have been booked in which the requirements of purchasers have been estimated on a most liberal scale.

The steel billet association made no change in the $21 Pittsburg price of billets. As premiums of $2 a ton and more are now paid for steel this market takes care of itself without association action. Formal action advancing the price may come in January, however.

Rail orders thus far booked for 1905 exceed 500,000 tons and there is pending fully 400,000 tons. Buying appears to have but fairly begun and predictions as to the total rail tonnage for 1905 are highly optimistic. The structural demand is assuming good proportions, bridge work having contributed a number of important contracts in the week. The Boston Elevated work went to the Fort Pitt Bridge Co., of Pittsburg, and the 12,000 tons of steel is reported to have gone to the Buffalo plant though this award has created some disturbance in the beam association that may end in a division of the tonnage. The steel bar advance still leaves a considerable margin between iron and steel, bar iron having gone up $1 a ton in the week, being now quoted at 1.60c Mahoning Valley mill. The plate mills, apart from vessel and steel car requirements, are not booking a tonnage at all measuring up to present capacity in this industry. Boiler manufacturers have been backward about contracting, new enterprises not yet having reached the boiler buying stage.

Firmness, with advances on some grades, marks the pig iron situation. Producers of foundry iron have sold the bulk of their product for the first quarter and buyers are generally covered for two or three months ahead. Second quarter business does not figure largely as yet. An advance in forge iron has followed a well-developed scarcity, and a Pittsburg contract for 10,000 tons was placed at the high level for the year, Northern iron bringing $16 and Southern iron $12.75 at furnaces having 25 cents lower freight than those in Birmingham. No. 2 Southern iron is firmly established at $13.50 and most Northern makers have advanced prices to $16.25 and $16.50 at furnace. It is not yet decided whether the Steel Corporation will buy Bessemer iron for January delivery. So many of its large furnaces have blown in lately that it may not need to go into the market. Sales of Bessemer have been made at $16 and $16.25 at furnace.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, DEC. 21.

Advances in shapes, plates and steel bars were made at association meetings held this week, but the reaffirmation of the billet schedule was unexpected. The billet and beam meetings were held on Monday and the plate and steel bar associations met yesterday. The billet manufacturers decided to reaffirm the prevailing schedule, despite the fact that steel for shipment within the next two months commands premiums from $1 to $3 a ton. It is doubtful now if any change in the present price will be made throughout the present upward movement, the market being in position to sustain itself. Furthermore, the association can be sustained to better advantage with billets on this lower basis than if the regular spread between steel and pig iron were to be maintained in the official quotations. Nor is this action without precedent. An official price of $19.75 was maintained throughout the last boom, although actual sales were made above $30. The annual meeting of the association was also held and it was decided to continue the present agreement for another year. The advance of $2 on structural shapes is considered conservative and indicates the caution that is being exercised by the steel manufacturers to prevent the market from soaring too high. Yesterday the steel bar and plate associations met, plates being advanced $2, Bessemer bars $2 and open-hearth bars $1. A slight change was made in the plate schedule, widths from 6¼ in. to 14 in. inclusive, instead of 6¼ in. to 24 in., commanding a price of $2 less than the greater widths. The leading producer of bar iron has also made an advance

of $1 a ton and muck iron has advanced the same amount. Ferro-manganese has been advanced $3 a ton, the demand for this material being so great from the corporation's own steel works that little can now be offered in the open market. On Thursday Dec. 15 a meeting of the shafting association was held in New York and prices were reaffirmed, while the Cold Rolled Steel Association met in this city last Friday and reaffirmed prices. It was learned, however, that one of its leading members has decided to withdraw the first of the year and the strength of that organization will be greatly impaired. The cut nail association advanced prices 10 cents a keg.

Demand for all kinds of raw and finished material continues strong and the week has witnessed considerable buying. We note sales of 10,000 tons of Northern forge and 3,000 tons of Southern, the former at $16 furnace and the latter on the basis of $12.75 Birmingham. The Lackawanna Steel Co. is also reported in the market for 25,000 tons of Bessemer for delivery the first quarter, but the United States Steel Corporation may not be a buyer of January iron. All depends on the working of its furnaces.

A contract for 21,000 tons of line pipe is to be placed this week by the Ohio Fuel Supply Co., and several large pipe lines are under consideration. The Ft. Pitt Bridge Co. of this city received the contract for erecting the Boston Elevated tracks amounting to 12,000 tons, and it is understood that the Lackawanna Steel Co. will furnish the material.

The Pennsylvania Railroad Co. last week placed its order for 1905 rail requirements amounting to 102,000 tons as compared with 202,000 tons placed for delivery the past year. No explanation is forthcoming for the decrease in requirements, although it is certain that a large portion of the tonnage that should have been delivered this year will be carried over, much improvement work having been stopped owing to the business depression. Rail orders amounting to 400,000 tons are pending, the Baltimore & Ohio, Reading, Jersey Central and the Norfolk & Western having inquiries out for 250,000 tons, while Western roads are asking for 150,000 tons. With the tonnage already booked, it is believed that 800,000 or 900,000 tons will be closed by the first of the year. Car plants now have orders on their books for about 60,000 cars, the bulk of which are steel, and further large orders are pending.

The recent cold snap, coupled with the water shortage which is affecting the entire western section of Pennsylvania has crippled the railroads and the movement of coal and coke to the blast furnaces and steel works is exceedingly slow. The Pennsylvania railroad is severely handicapped, its water supply having given out almost entirely, and 25 trains of tank cars are moving daily to keep the engines supplied. Unless there is some relief in the near future the movement of freight will be still further curtailed and the outlook is anything but promising. On account of the low water in the rivers in this vicinity and its high sulphur content, thousand of horse power of steam generating capacity is daily out of use, two of the blast furnaces of the Edgar Thomson plant already being banked. The movement of coke from the Connellsville region has been curtailed fully 40 percent, and while a few stacks in this district and in the Valleys have good stocks on hand the majority have been unable to accumulate more than a few days' supply. Coke for prompt shipment has advanced to $2.40 to $2.50 for furnace, while foundry is held at $2.75 to $3.

The Carnegie Steel Co. continues to blow in its idle furnace capacity, while steel works are resuming as fast as the iron can be secured. The Mingo Junction Bessemer plant resumed last week, while the Bessemer plant at Columbus will be on next week. Every steel works operated by the Carnegie Steel Co. will then be in operation with the exception of the Donora plant, and the twelve open-hearth furnaces there will resume shortly after the first of the year when the two blast furnaces will be on. The two Columbus stacks will resume this week, and the North Sharon stack will be on as soon as repairs can be made. With these furnaces in operation this company will have only two idle stacks out of a total of 51. Never before has the iron and steel capacity of this company operated as at present and if this is any criterion of the increase in consumption it must be prodigious. The American Steel & Wire Co. this week blew in its idle Edith stack and it is reported that the Neville Island furnace will shortly resume. This week 144 of the 165 sheet mills of the American Sheet & Tin Plate Co. are in operation.

Pig Iron.—Advances have been made in all grades of iron and owing to the poor shipment of coke and to water shortage further advances are looked for. The United States Steel Corporation is not securing scheduled deliveries of its December Bessemer iron bought from merchant furnaces and from present indications some of the iron will run into January. We note the sale of 1,000 tons of Bessemer at $16 at furnace and another at $16.25 for 2,500 tons, prompt delivery. We also note the sale of 10,000 tons of Northern forge at $16 at the furnace for delivery the first quarter and 3,000 tons of Southern forge at $12.75 Birmingham, equal to $17.10, Pittsburg for delivery in January and February. One of the furnaces of the Shenango Furnace Co., Sharpsville, will blow in this week, while another idle stack at this plant will come in in February. We revise quotations as follows:

Bessemer, Valley	$16 00 to 16 25
Bessemer, Pittsburg	16 85 to 17 10
No. 1 Foundry	18 00 to 18 25
No. 2 Foundry	17 85 to 17 85
Gray Forge, Pittsburg	16 60 to 16 85
Basic, Valley	15 75 to 16 00
Basic, Pittsburg	16 60 to 16 85

Steel.—At the meeting of the billet association held Monday prevailing prices were reaffirmed. This action was entirely unexpected, as an advance of $2 was looked for. Premiums from $1 to $3 are being paid on billets for early shipment while sheet and tin bars are selling at a premium of $2. The Carnegie Steel Co. is exceedingly short of open-hearth steel and its idle open-hearth capacity is being put into operation as speedily as possible. Rods have also advanced, being now quoted at $30.50 to $31. Chain makers have been buying heavily and owing to the big increase in the demand for chain their specifications are heavy. The demands of the wire mills are also unprecedented. Agreed quotations on steel are as follows: Bessemer and open-hearth billets, 4 x 4 in., and slabs, up to and including 0.25 carbon, $21, f. o. b. mill, Pittsburg; with actual freight to points of delivery; 0.26 and including 0.60 carbon, $1 advance, 0.61 to 1.00 carbon $2 advance. Billets smaller than 4 x 4 in., $2 advance; sheet and tin bars, $23; cut bars, $23.50; forging billets, $23. Bessemer and open-hearth steel rods are held at $30.50 to $31.

Ferro-Manganese.—An advance of $3 a ton has been made in manganese, and domestic 80 percent, is now $46 in carload lots delivered at buyer's mill, any point east of the Mississippi.

Skelp.—Further advances have been made in both iron and steel skelp, one sale of 5,000 tons of iron having been made at 1.80c Pittsburg, for sheared. We make the following quotations: Grooved steel skelp 1.45c to 1.50c, and sheared 1.55c to 1.60c. Grooved iron, 1.65c to 1.70c and sheared, 1.75c to 1.80c.

Muck Bar.—Neutral bars are now quoted at $28.85 Pittsburg.

Rails and Track Material.—The Pennsylvania Railroad

Co. last week placed an order for 102,100 tons of rails for delivery during 1905. The last order placed by this company in June, 1903 for delivery in 1904, called for 202,000 tons, and the curtailment in requirements is no doubt due to a large unshipped tonnage which will be carried over into next year. The contract was divided as follows: United States Steel Corporation, 55,500 tons; Lackawanna Steel Co., 7,000 tons; Cambria Steel Co., 20,100 tons; Pennsylvania Steel Co., 20,100 tons. Eastern and Western roads are in the market for about 400,000 tons which will shortly be placed. We make the following quotations: Fifty lbs. and over 500 tons, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 16-lb., $25; 20 lb., $24; 25 to 45 lb., $23. Angle bars, 1.25c; spikes, 1.65c to 1.70c.

Plates.—At the meeting of the plate association held yesterday a slight change was made in the schedule, only widths from 6¼ in. up to 14 in. inclusive being now $2 below other sizes instead of widths up to 24 in. The advance amounts to $2 a ton. Specifications from steel car plants continue exceedingly heavy and it is reported that the car works have orders on their books for about 60,000 steel and wooden cars. We revise quotations as follows: Tank plates, ¼ in. thick, 6¼ to 14 in., inclusive, 1.40c f. o. b. mill Pittsburg; over 14 in. up to 100 in., 1.50c. Extras are as follows per lb.: Flange and boiler steel, 10c; marine, A. B. M. A., and ordinary fire box, 20c; still bottom, 30c; locomotive fire box, 50c; plates over 100 in. up to 110 in width, not less than 5c per 100 lb. extra; plates 110 in. to 115 in. wide, not less than 10c extra; 115 to 120 in., 15c extra; plates 120 in. to 125 in. wide, not less than 25c extra; plates, 125 in. to 130 in., not less than 50c extra; plates 130 in. wide, not less than $1 extra; plates 3-16 in. thick $2 extra, gauges 7 and 8, $3 extra; No. 9, $5 extra. Five cents extra for less than carloads. Terms net cash in 30 days, and for all points of delivery in the United States except the Pacific Coast.

Structural Material.—At a meeting of the beam association held yesterday an advance of $2 was made. The outlook for shapes is unusually bright and a big year is looked for. The contract for the Boston Elevated was awarded the Ft. Pitt Bridge Co. of this city and calls for 12,000 tons. While the competition for this order was great, the low prices made earlier in the year on large orders were not brought out. The American Bridge Co. now being fairly well filled up is no longer making low prices to secure business as was the case during the summer months. We revise quotations as follows: Beams and channels up to 15 in., 1.50c; over 15 in. 1.60c; angles, 3 x 2 up to 6 x 6, 1.50c; zees, 1.40c; tees, 1.55c; angles from 3 to 16 in., 1.50c; universal and sheared plates, 6¼ to 14 in., inclusive, 1.40c; over 14 in., 1.50c base.

Bars.—At the meeting of the steel bar association yesterday Bessemer bars were advanced $2 and open-hearth $1 a ton. Bar iron has also been advanced $1 a ton and is now held at 1.64¼c Pittsburg. Specifications for bars are heavy and the consumption is greatly on the increase. We revise quotations as follows: Bar iron, 1.60c to 1.64¼c Pittsburg; hoops, 1.55c, and bands, 1.40c, both taking bar extras. Bessemer steel bars, 1.40c; open-hearth steel bars, 1.40c; plow and cultivator beams, 1.40c, net; channels, angles, zees and tees, under 3 in., 1.50c. The following differentials are maintained on steel: Less than 2,000 lb. of a size and not less than 1,000 lb., 10 cents advance; less than 1,000 lb. of a size, 30 cents advance.

Sheets.—Demand for sheets continues heavy and prevailing prices are being maintained. For forward delivery premiums from 1 to $2 a ton are being secured. We make the following quotations on carload lots: Black sheets, one pass, No. 8, 1.75c; No. 9, 1.80c; Nos. 12 to 14, 1.85c; Nos. 15 to 17, 1.90c; Nos. 18 to 21, 1.95c; Nos. 22 to 24, 2c; Nos. 25 to 26, 2.05c; No. 27, 2.10c; No. 28, 2.20c; No. 29, 2.50c; No. 30, 2.60c. Galvanized: Nos. 16 to 17, 2.40c; Nos. 18 to 21, 2.45c; Nos. 22 to 24, 2.60c; Nos. 25 to 26, 2.80c; No. 27, 3c; No. 28, 3.30c; No. 29, 3.60c; No. 30, 4c.

Wire and Wire Nails.—The cut nail manufacturers have advanced prices 10 cents a keg. Demand for wire nails continues heavy, while all grades of fencing are in good demand. We revise quotations as follows: Wire nails, jobbers' carload lots, $1.75; retailers' carloads, $1.80; and less than carloads, $1.90; painted barb wire, $1.90 to jobbers in carloads; retailers' carloads $1.95, and less than carloads, $2.05, with 30 cents for galvanizing. Annealed smooth fence wire is held at $1.60, with the usual differentials to retailers for carloads and less than carloads. Quotations are all f. o. b. Pittsburg, 60 days, with 2 percent discount for cash in ten days. Iron and steel cut nails are held at $1.80 Pittsburg.

Pipes and Tubes.—The Ohio Fuel Supply Co. this week will place an order for 21,000 tons of 16 and 18-in. line pipe for a line 120 miles in length to reach Cincinnati. Several other large lines are pending. Discounts to consumers, carload lots, f. o. b. Pittsburg, plus freight to destination according to Tube Rate Book, are as follows:

MERCHANT PIPE.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch	69	58	67	51
⅜ to 6 inches	77	67	75½	65½
⅞ and ½ inch	78	61	71	59
7 to 12 inches	72	57	70½	55
Extra Strong Plain Ends.				
⅛ to ⅜ inch	62	50	60	48
½ to 4 inches	69	57	67	55
4½ to 8 inches	65	53	63	51
Double extra strong plain ends, ⅜ to 8 inches	58	47	56	45

MERCHANT BOILER TUBES, LESS CARLOADS, 22 FEET AND UNDER.

	Steel.	Iron.
1 to 1½ inches	46	43
1¾ to 2¼ inches	56	45
2½ inches	60	48
2¾ to 3 inches	66	55
6 to 13 inches	58	48

Merchant Steel.—A meeting of the shafting association was held in New York last Thursday and prevailing prices were reaffirmed. At a meeting of the Cold Rolled Steel Association held here last Friday prices were reaffirmed, but the West Leechburg Steel Co., one of the leading factors announced its withdrawal the first of the year. We make the following quotations: Cold rolled and ground shafting 52 percent off in carload lots, and 47 off in less than car lots, delivered in base territory; tire steel, 1.50c to 1.55c; open hearth spring steel 1.90c to 2c; sleigh shoe, flat, 1.45c to 1.50c; smooth finished machinery steel, 1.50c; toe calk, 1.85c to 1.90c.

Old Material.—Demand for heavy melting stock and low phosphorus material continues to increase daily and prices continue to advance. Heavy melting stock, owing to the heavy demands on the part of the open-hearth plants, is held at $17 Pittsburg, while low phosphorus scrap is quoted at $20 to $20.50. Rerolling rails have advanced to $17 to $18 while cast scrap is held at $15.50. Even at these prices the dealers that have large stocks are not anxious to sell and still higher prices are looked for. We revise quotations, gross tons as follows: Heavy melting stock, $16.50 to $17; Low phosphorus stock, $20 to $20.50; No. 1 cast scrap, $15 to $15.50; cast iron borings, $10.50 to $11; No. 1 wrought, $17.50 to $18, net tons; rerolling rails, $16.50 to $17.

Coke.—Water shortage coupled with transportation delays has seriously crippled coke production and transportation. The increased demand in addition has resulted in stiff advances all along the line. One contract for furnace coke for delivery the first half of the year was closed at $2.40, while for prompt delivery $2.50 is asked. Foundry coke for delivery through the first half or for prompt shipment is held at $2.75 to $3. In the upper Con-

nellsville region only 4,068 of a total of 21,178 ovens are idle, while only 756 of the 6,189 ovens in the lower region are out. The production of the upper region during the week ending Dec. 10 was 215,268 tons, while the lower region produced 66,588 tons.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, DEC. 20.

Conditions in the local iron and steel market have not altered to any great extent since our last report. In the way of new business, demand has been quieter than for several weeks past, a lull which is attributed to the holiday season and to the nearness of the inventory period. In some lines, notably crude metal, consumers are pressing manufacturers for prompter shipments, even to the extent of anticipating deliveries, a feature significant of the trend of the times. At no period this year has the outlook been so bright or sellers so sanguine of the future. A brisk supplementary demand for all materials is looked for after the first of the year, despite the fact that the greater portion of the Western interests have covered for their expected requirements in the first quarter of 1905. Rails have been the center of interest in this market this week. Since prices were definitely fixed ten days ago, contracts for about 150,000 tons have been placed with local interests. None of the Western trunk lines has as yet made known its wants, the orders placed thus far coming from the smaller roads and ranging in size from 46,000 tons to 2,000 tons. Premiums of $1 to $2 a ton on billets have been asked and obtained by Western makers for some time; while in the case of steel bars, the Republic Iron and Steel Co. and other manufacturers have for some time been asking $2 a ton above association prices.

Pig Iron.—The Northern interests that have been holding their product between $16.50 and $17 Chicago for No. 2 foundry, last week advanced prices to the basis of $17, and this quotation is now established. There is very little iron from lake furnaces being offered at the present time, however, the two leading interests having withdrawn from the market. Even at the new schedule, Northern furnaces are still 15 cents below Southern prices, and for this reason Southern producers are practically debarred from the business under negotiation. The total tonnage placed in the week under review has been comparatively light, melters in need of iron bending their efforts to getting quick shipments or their deliveries anticipated rather than contracting for new wants. It is not expected that there will be much further buying until after the first of the year, and if the supplementary tonnage is as great as sellers anticipate it will be, accompanying the general improvement in the business situation, higher prices are predicted. We have revised our prices and quote for Chicago delivery as follows:

Lake Superior Charcoal	$18 00
Northern Foundry No. 1	17 50
Northern Foundry No. 2	17 00
Northern Foundry No. 3	16 50
Northern Scotch Foundry	17 50
Ohio Strong Softeners No. 1	19 30 to 19 80
Ohio Strong Softeners No. 2	18 30 to 18 80
Southern Foundry No. 1	17 65
Southern Foundry No. 2	17 15
Southern Foundry No. 3	16 65
Southern Foundry No. 4	16 15
Southern No. 1 Soft	17 65
Southern No. 2 Soft	17 15
Southern Gray Forge	15 90
Southern Mottled	15 90
Southern Silveries (4% to 6% Silicon)	18 15 to 18 65
Jackson Co. Silveries (6% to 8% Silicon)	19 80 to 20 30
Jackson Co. Silveries (8% to 10% Silicon)	20 30 to 21 80
Alabama and Georgia Car Wheel	19 65
Malleable Bessemer	17 50
Basic Iron	17 15

Billets.—Prices on billets and sheet bars are extremely strong, but it is understood no advance was made at the meeting of the association held today. Some small sales have been made in this market in the past week at a premium of $1 a ton over and above all extras. Mills are reluctant to accept orders in view of the strong probability of a marked scarcity of open-hearth steel in the coming year and considerably higher prices ruling. We continue to quote carload lots, Chicago delivery, as follows: Forging billets, 4 x 4 and larger, up to but not including 10 x 10, up to .25 carbon, $26; up to and including .60 carbon, $1 extra; rerolling billets, Bessemer or open hearth, 4 x 4 and larger, $24; billets, 3⅞ in. and smaller, and sheet and tin bars, $26. Wire rods, $30 Pittsburg.

Bars.—New business in steel bars is not of heavy proportions, though specifications are in excellent volume. Demand for bar iron from all sources, and particularly from railroads and carbuilders, is brisk, mills having all the business they can attend to. Prices are without change, though an advance is daily expected in steel. We quote carload lots, mill shipments, Chicago delivery, as follows: Bar iron, 1.65c to 1.70c; Bessemer steel bars and bends, 1.46½c base, half extras; open hearth, $1 advance; soft steel angles, less than 3 x 3, 1.56½c; hard steel angles, 1.50c to 1.65c; hoops, 1.71½c rates, full extras. From store, iron bars are quoted, 1.85c to 1.90c; base, full extras; soft steel bars and bands, 1.65c to 1.75c base, half extras; soft steel angles, channels and tees, 1.75c to 1.85c, half extras; hoops, 2c to 2.10c rates, full extras.

Sheets.—No decline is to be noted in the good volume of business daily coming forward, both black and galvanized sheets sharing in it. Independent mills are holding to their schedules firmly, in some cases asking from $1 to $2 a ton above the prices of the leading producer. The recent advance in galvanized sheets has been well sustained, and an advance in black sheets is contemplated by some of the outside manufacturers. We quote prices, carload lots, mill shipments, Chicago delivery, as follows: Blue annealed sheets, Nos. 9 and 10, 1.76½c to 1.81½c; Nos. 11 and 12, 1.81½c to 1.86½c; Nos. 13 and 14, 1.86½c to 1.91½c; Nos. 15 and 16, 1.96½c to 2.01½c. On box annealed, one pass, cold rolled, we quote: Nos. 18 and 20, 2.11½c to 2.16½c; Nos. 22 and 24, 2.16½c to 2.21½c; Nos. 25 and 26, 2.21½c to 2.26½c; No. 27, 2.26½c to 2.31½c; No. 28, 2.36½c to 2.41½c; No. 29, 2.46½c to 2.51½c; No. 30, 2.56½c to 2.61½c. Jobbers report an active business and that prices are extremely firm. We quote warehouse prices as follows: No. 10, 1.95c to 2c; No. 12, 2c to 2.05c; No. 14, 2.05c to 2.10c; No. 16, 2.15c to 2.20c; No. 18, 2.30c to 2.35c; No. 20, 2.35c to 2.40c; No. 22, 2.40c to 2.45c; No. 24, 2.45c to 2.50c; No. 26, 2.50c to 2.55c; No. 27, 2.60c to 2.65c; No. 28, 2.70c to 2.75c; No. 29, 2.80c to 2.85c. Galvanized sheets, mill shipments, Chicago delivery, are quoted as follows: Nos. 12-14, 2.46½c; No. 16, 2.61½c; Nos. 18-21, 2.76½c; Nos. 22-24, 2.91½c; No. 26, 3.11½c; No. 27, 3.31½c; No. 28, 3.51½c. Jobbers' prices have been advanced $2 a ton, and we revise our store prices as follows: Nos. 10 to 16 inclusive, 2.80c to 2.90c; Nos. 18 and 20, 2.90c to 3c; Nos. 22 and 24, 3.10c to 3.20c; No. 26, 3.30c to 3.40c; No. 27, 3.50c to 3.60c; No. 28, 3.70c to 3.80c; No. 29, 4.15c to 4.25c; No. 30, 4.60c to 4.70c.

Structural Steel.—Specifications from local jobbers and consumers who buy direct from mills indicate no decrease in the consumption of structural shapes. Store trade has also shown a marked improvement and jobbers are doing a brisk business from warehouse stocks. Prices are firm, and we quote Chicago delivery, mill shipments, as follows: Beams and channels, 3 to 15 in. inclusive, 1.56c; angles, 3 to 6 in., ¼-in. and heavier, 1.56½c; angles, larger than 6 in. on one or both legs, 1.66½c; beams, larger than 15 in., 1.66½c; zees, 3-in. and over, 1.56c; tees, 3-in. and over, 1.61½c, with the usual extras for cutting to exact lengths,

punching, coping, bending or other shop work. Store prices on structural materials according to tonnage are 1.85c to 2c for angles, beams, channels, base sizes, with 1.95c to 2.05c for 18, 20 and 24-in. beams; tees and zees, 1.90c to 2c. These prices are for either random lengths or cut to lengths.

Plates.—The local situation is without material change. Mills report there is no lack of specifications against contracts, and jobbers advise that the store trade is very active. Prices are firm and without change, our quotations being on carload lots, mill shipments, Chicago delivery: Tank steel, ¼-in. and heavier, 24-in. wide and under, rectangular plates only, 1.46½c base; over 24-in. to 100-in. wide, 1.56½c base; flange steel, 1.66½c base; marine steel, 1.76½c base, all full extras. Plates, 3-16 in. thick, $2 extra; gauges, 7 to 8, $3 extra; No. 9, $5 extra. Less than carload lots, $5 extra. All the local jobbers have advanced their prices on lots from stock, ranging from $1 to $3 a ton, according to the size of the order and delivery required. We have revised our quotations, and now quote as follows: Tank steel, ¼-in. and heavier, 1.85c to 2c; 3-16, 1.95c to 2.05c; No. 8, 1.95c to 2.05c; flange steel, 2.10c to 2.25c.

Rails and Track Supplies.—The tonnage placed with rail mills since the reaffirmation of prices is somewhat disappointing in view of the reports of the large contracts that it was predicted would follow the fixing of prices for the coming year. Only the smaller Western roads have thus far contracted for their wants, the local interest having booked orders amounting to about 150,000 tons. The trunk lines are still to be figured with. Light rails and track supplies are active, Western mills having all the current business they can handle in both these products. We quote heavy sections in 500-ton lots and over, f. o. b. mill, $28; less than 500 tons to carload lots, $30; less than carload lots, $32. Light rails are as follows: 12 lb. sections, $26; 16 lb., $25; 20 and 25 lb., $24; 30, 35, 40 and 45 lb. sections, $23, all f. o. b. Milwaukee mill. Track supplies, f. o. b. Joliet mill: Angle bars, $1.30c to 1.35c; spikes, first quality, 1.70c to 1.75c; track bolts, 3¼ x ¾, with square nuts, 2.30c to 2.40c per 100 lbs., with hexagon nuts, 2.45 to 2.55c.

Merchant Steel.—The situation is without material change, the leading manufacturers having withdrawn from the market so far as further new tonnage is concerned. Specifications are numerous and in good volume. Prices are without change, and we quote mill shipments, Chicago delivery, as follows: Spring steel, 1.85c; sleigh shoe, flat sizes, 1.51½c; concave and convex, 1.60½c to 1.71½c; cutter shoe, 2.25c; smooth finished machinery steel, 1.71½c; smooth finished tire. 1.66½c; plow steel, 2.20c and upwards, according to quality; toe calk steel, 2.01½c; crucible tool steel, 6½c to 8c; special grades of tool steel, 13c and up; cold rolled shafting, 52 percent from list in carload lots, and 47 percent discount in less than carload lots.

Merchant Pipe.—Mills report an increase in each week's business over that preceding. Specifications are heavy, in some cases anticipating contract quotas. Prices are without change, and we quote carload lots, mill shipments, random lengths, f. o. b. Chicago, as follows:

MERCHANT PIPE.

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Guaranteed Wrought Iron Pipe. Black. Percent.	Guaranteed Wrought Iron Pipe. Galv. Percent.
⅛ and ¼ inches	67.35	51.35	65.35	49.35
⅜ and ½ inches	71.35	59.35	69.35	57.35
¾ to 6 inches	75.35	65.35	73.35	63.35
7 to 12 inches	70.35	55.35	68.35	53.35

Boiler Tubes.—What has been said of merchant pipe can be truthfully stated with regard to boiler tubes. The outlook is very promising gauged by the volume of specifications and new business coming forward each day. Prices are without change, and we quote carload lots, mill shipments, Chicago delivery, as follows:

BOILER TUBES.

	L. W. Steel Percent.	C. C. Iron. Percent.	Seamless Steel. Percent.
1 to 1½ inch	44.35	41.35	52.35
1¾ to 2¼ inch	56.35	41.35	40.35
2½ inch	58.35	46.35	43.35
2¾ inch to 5 inch	64.35	53.35	Up to 4 inches 50.35
6 to 13 inch	56.35	41.35	

The following are the agreed discounts from store:

	Steel.	Iron.	Seamless Steel.
1 to 1½ inches, inclusive	40½	37½	40
1¾ to 2¼ inches, inclusive	50½	35	37½
2½ inches, inclusive	53	37½	40
2¾ to 6 inches, inclusive	60½	47½	47½
6 inches and larger	50½	35	

Cast Iron Pipe.—This being an unseasonable period of the year for the laying of pipe, the market is experiencing its usual dullness. There are some good-sized contracts pending, however, and in the spring a brisk demand is looked for. Prices are without change, and we quote carload lots, Chicago delivery, as follows 4-in. water pipe, $28.50; 6-in. and larger, $27.50; gas pipe, $1 a ton higher.

Wire Products.—No cessation is to be noted in the demand for all classes of wire products, the orders being well distributed among the jobbing, retail and manufacturing interests in the entire West and Northwest. Prices are firm. We quote carload lots, mill shipments, Chicago delivery, as follows: Wire nails, $1.90; painted barb wire, $2.05; galvanized barb wire, $2.35; smooth annealed wire, $1.75; smooth galvanized wire, $2.05; polished staples, $2; galvanized staples $2.30. Less than carload lots to jobbers are 5 cents higher than above prices. The retail trade is quoted 5 cents extra over the foregoing on carload lots, and 10 cents extra on less than carload lots. Bale ties are unchanged at 82½ and 5 percent to 85 percent discount f. o. b. Waukegan, Ill., on straight carload lots. Poultry netting, 85 and 5 percent discount from list f. o. b. Joilet and DeKalb, with actual freight allowed not exceeding 30 cents per 100 pounds.

Foundry Coke.—Demand for coke is strong and prices show an advancing tendency. Standard 72-hour Connellsville brands are now held at from $2.75 to $2.85 ovens, or from $5.40 to $5.50 Chicago. Wise County (Va.) coke has sold at $2.85 ovens, or $5.50 Chicago during the week, and this is the price at which it is held by some local dealers.

Old Material.—While the market can still be reported as a strong one, demand is not as insistent as it was, an easing off which dealers have welcomed rather than otherwise. Railroad offerings have been heavy in the past ten days, to which may be due, in a measure, the quietness that exists. The C. B. & Q. R. R. has a list out of 4,000 tons, and the C. M. & St. P. Ry., one of 3,000 tons, both of which will come up for disposal Dec. 21. There are one or two other smaller lists from Western roads, but the tonnage is not of great proportions. We have revised our prices in accordance with the views of local dealers and consumers, and quote dealers' selling prices, gross tons, as follows:

Old steel rails (4 feet and over)	$16 00 to 16 50
Old steel rails (less than 4 feet)	15 00 to 15 50
Old iron rails	21 00 to 22 00
Relaying rails, subject to inspection	22 00 to 22 50
Relaying rails, without inspection	20 00 to 20 50
Old wheels	16 00 to 16 50
Heavy melting steel	13 50 to 14 00
Mixed country steel	9 75 to 10 25
Low phosphorus scrap (.05 and under)	14 00 to 14 50

The following quotations are for net tons:

No. 1 R. R. wrought	17 00 to 17 50
No. 2 R. R. wrought	16 00 to 16 50
Shafting	17 00 to 17 50
Dealers' Forge, No. 1	14 00 to 14 50

Wrought pipe and flues	13 00 to 13 50
No. 1 cast, 150 lb. and less	13 00 to 14 00
No. 1 mill	11 00 to 11 50
No. 1 Busheling	12 50 to 13 00
No. 2 Busheling	11 00 to 11 50
Country sheet	8 00 to 8 50
No. 1 boilers, cut	11 50 to 12 00
Boiler punchings	13 50 to 14 00
Iron car axles	21 50 to 22 50
Steel car axles	17 00 to 17 50
Iron axle turnings	11 50 to 12 00
Steel axle turnings	11 50 to 12 00
Cast borings	8 00 to 8 50
Mixed borings, etc.	8 00 to 8 50
Machine shop turnings	11 00 to 11 50
Railroad malleable	13 00 to 13 50
Agricultural malleable	12 50 to 13 00
Stove plate and light cast scrap	12 50 to 13 00
Old iron splice bars	18 50 to 19 00

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, DEC. 21.

The drouth prevailing throughout the Central West has become a very important factor in the iron and steel trade. The coke regions are suffering severely, railroads find it necessary to haul water for their locomotives, some plants have been closed and others are in imminent danger of being compelled to stop operations. A continuance of these conditions will be disastrous.

Iron Ore.—The past week has been uneventful, as neither buyers nor sellers are anxious to open negotiations for next year. Occasional sales are made at prices 50 to 75 cents above those which prevailed at the opening of the past season. A conference of officials of the Pittsburg Steamship Co. and the chief engineers of its fleet will be held at an early date and other conferences with union representatives will probably follow, as it is desired to have all labor questions settled before the opening of navigation.

Pig Iron.—The market is quiet, but firm. As the end of the year approaches, buyers are not disposed to buy for the future, and their immediate requirements are, as a rule, provided for. The bottom price in the Valley is $16 for No. 2 foundry for the first or second quarter and an occasional small lot for delivery within the next two months has been sold as high as $17. Basic and Bessemer are strong at $16 to $16.25 at the furnace. Some Southern iron has recently been sold below $13.50, Birmingham, for No. 2, but $13.50 is now the lowest price, and some interests are asking $13.75 and $14. We quote as follows, Cleveland delivery:

Bessemer	$16 85 to 17 10
No. 1 Foundry	16 75 to 17 25
No. 2 Foundry	16 50 to 16 90
No. 3 Foundry	15 75 to 16 00
No. 2 Southern	16 85 to 17 60
Gray Forge	16 60 to 16 85
Gray Forge, Southern	16 00 to 16 60
Lake Superior charcoal	17 00 to 17 50

Coke.—Scarcity of cars and the drouth have made it very difficult for furnaces and foundries to get enough coke to keep their plants in operation. The usual quotations are $2.50 for furnace coke and $2.75 for foundry, but it is not so much a question of price as of ability to get supplies.

Finished Material.—Owing to the expectation of higher prices on plates, shapes and bars, buyers have been eager to contract, but sellers have been reluctant about taking orders and have in some cases refused to do so. Although specifications have improved, there is still complaint that they are not coming in as fast as they should. This is not the time of year for liberal specifying and in some quarters there is a feeling that the real test of market conditions will not be made for several months. Hence conservative dealers are not certain whether advances of prices made this week are justified. The advance of $2 per ton on structural material was made not only on account of improved demand at present, but also because the outlook for next spring is very encouraging. Steel bars are now quoted at 1.49½c Cleveland or 1.40c Pittsburg for both open-hearth and Bessemer, an advance of $2 per ton on Bessemer and $1 on open-hearth.

Plates have been selling at 1.30c Pittsburg for tank, 6¼ to 24 in., and wider plates up to 100 in. at 1.40c. The new quotations are 1.40c for plates 6¼ to 14 in. and wider plates up to 100 in., 1.50c. Bar iron has been advanced to 1.65c at the mill, but some mills are still short on orders. The demand for light rails continues strong and some orders for standard sections are being placed. The sheet trade, since the recent advances, has been rather quiet. The prices of the principal producers through jobbers are as follows: Cleveland delivery, the freight from Pittsburg being 9½ cents: Mill sales of black sheets in car load lots, No. 10, 1.69½c; No. 11-12, 1.74½c; No. 14, 1.79½c; No. 16, 1.89½c; No. 27, 2.24½c; No. 28, 2.34½c. Galvanized mill sales: No. 14, 2.49½c; No. 16, 2.59½c; No. 18-20, 2.73½c; No. 22-24, 2.89½c; No. 25, 3.09½c; No. 27, 3.29½c; No. 28, 3.49½c. Out of stock, black sheets ¼ in., 1.70c; 3-16 in., 1.80c. Blue annealed, No. 10, 2c; No. 12, 2.05c; No. 14, 2.10c; No. 16, 2.20c. One pass cold rolled: No. 18-20, 2.35c; No. 22-24, 2.40c; No. 26, 2.45c; No. 27, 2.50c; No. 28, 2.60c; No. 30, 3c. Galvanized out of stock: No. 16, 2.85c; No. 18-20, 2.95c; No. 22-24, 3.10c; No. 26, 3.30c; No. 27, 3.50c; No. 28, 3.70c; No. 30, 3.50c.

Old Material.—The market in this city is extremely quiet, but prices are firm and unchanged. We quote as follows, gross tons, Cleveland:

Old iron rails	$20 00 to 21 00
Old steel rails (over 6 feet)	15 50 to 16 50
Old steel rails (under 6 feet)	15 00 to 16 00
Old car wheels	15 50 to 16 00
Steel boiler plate	10 00 to 11 00
Steel axles	17 00 to 18 00
Malleable iron (railroad)	15 00 to 15 50
Malleable iron (agricultural)	14 50 to 15 00
Heavy steel	15 00 to 15 50

We quote as follows, net tons:

No. 1 R. R. wrought	17 00 to 17 50
No. 1 busheling	14 50 to 15 00
No. 1 machine cast	14 50 to 15 00
Iron axles	19 00 to 20 00
Axle turnings	12 50 to 13 00
Wrought turnings (free from cast)	10 50 to 11 00
Grate bars	10 00 to 10 50
Pipes and flues	13 00 to 14 00
Tank iron	10 00 to 10 50
Hoop and band iron	8 00 to 9 00
Sheet iron	6 50 to 7 50
Wrought drillings	10 00 to 11 00
Stove plate	11 00 to 11 50
Cast borings	8 00 to 8 50

Worth Bros. Co., of Coatesville, Pa., announces that it has opened an office at 1116 New England Bldg., Cleveland, for the sale of its products, appointing H. A. Jackson as sales agent for Northern Ohio.

CINCINNATI.

Dec. 20

The coke situation is even more a feature than for the past few weeks. The offerings are limited and prices are strong. Transactions are now mainly in spot coke, and standard brands of furnace coke are quoted at $2.50 and foundry coke at $2.75 to $3 f. o. b. ovens. A few unknown makes are available at lower prices than above quoted. There is difficulty in getting shipments forward on contracts and it is noted that a few furnaces have been obliged to bank because of delays in transportation.

Pig Iron.—The week has not been so active in point of orders; still there has been no cessation of interest in the market and the comparative quietude is attributed to the holiday season in part and the disinclination of buyers to take on more iron during the period of annual stock taking. The most prominent feature of the market has been the strength in gray forge iron, brought to light by the inquiry of a large consumer in the Pittsburg territory. It is ascertained that sales of gray forge have been made during the week at from $12.50 to $12.90 Birmingham. One sale is reported of 3,000 tons which went to another consumer for delivery in the first half of next

year on the basis of $13 Birmingham, but it is fair to say that the furnace price on this sale would be equivalent to $12.75 Birmingham in Ohio territory. The market for Southern iron is firm and while the bulk of the business is still going at $13.50 Birmingham, and for standard brands that price is well maintained, there are constant reports of sales at $13 for No. 2 foundry. It may be suggested however, that some inquiries for No. 2 foundry are resulting in sales of analysis iron running up in silicon but which are not strictly No. 2 foundry, being in fact gray forge or No. 4 of high silicon content. It is safe to say that no standard brand of No. 2 foundry can be bought on analysis or fracture at less than $13.50 Birmingham. Large concerns having their own chemists can use these analysis irons to advantage and it is quite reasonable to believe that the effect of such transactions has been misleading in their influence on market prices. The tone of the market is strong and sellers are confident. It is reported that odd lots which a week ago would not move at the prices asked are now selling, which is regarded as evidence that buyers are meeting sellers' views. While in a general way there has been no change in the prices of the higher grades of iron ,for reasons given above we deem it correct to revise quotations to conform to the understood basis of prices now prevailing. Quotations f. o. b. Cincinnati are as follows:

Southern Foundry No. 1	$16 75 to 17 00
Southern Foundry No. 2	16 25 to 16 50
Southern Foundry No. 3	15 75 to 16 00
Southern Foundry No. 4	15 50 to 15 75
Southern Foundry No. 1, soft	16 75 to 17 00
Southern Foundry No. 2, soft	16 25 to 16 50
Gray Forge	15 25 to 15 50
Northern Foundry No. 1	17 65
Northern Foundry No. 2	17 15
Southern Charcoal	18 75 to 19 00

Finished Material.—Wire advices today are to the effect that steel bars and structural material have advanced $2 per ton and our quotations are revised accordingly. Bar iron remains firm and is quoted $1 higher than a week ago. The demand is fair but it is too early to say how the advance will be met by buyers. Bar iron is quoted at 1.65c; steel bars at 1.53c, half extras, with dealers quoting 1.85c for iron and steel out of store. Galvanized sheets at 75 and 10 and 5 percent off. We quote black sheets, No. 27, at 2.40c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.70c; No. 27, 2.60c; No. 16, 2.20c; No. 14, 2.10c; No. 12, 2.05c; No. 10, 2c. Tank plates are dull and sell out of stores at 1.85c for ¼-in. and 1.95c for 3-16. No. 8 and No. 10. Beams and channels are quoted at 1.95c from stock, and angles at 1.95c to 2c for base sizes.

The merchant pipe market is unchanged but the trade is expecting the leading interest to advance its quotations in the near future. Boiler tubes are only quoted on application with specifications. Car load lots are quoted as follows, f. o. b. Cincinnati:

MERCHANT PIPE.
(Basing Discounts.)

	Steel Pipe.		Guaranteed Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ and ¼ inches	67.35	51.35	65.35	49.35
⅜ and ½ inches	71.35	59.35	69.35	57.35
¾ to 6 inches	75.35	65.35	73.35	63.35
7 to 12 inches	70.35	55.35	68.35	53.35

Old Material.—Consumers are still holding off at the advance in prices but there is no indication of weakness on the part of holders. We quote the market firm but unchanged with quotations as follows:

Old No. 1 railroad wrought, net tons	$15 00 to 15 50
Cast machine and foundry, net tons	13 50 to 14 00
Old iron rails, gross tons	19 00 to 20 00
Old steel rails, gross tons	14 00 to 15 00
Old short lengths, gross tons	14 50 to 15 00
Old iron axles, net tons	19 00 to 20 00
Stove plate, net tons	9 50 to 10 00
Wrought turnings, net tons	10 00 to 10 50
Cast borings, net tons	9 00 to 9 50

PHILADELPHIA.

Dec. 20

At this season, when there is generally a slackening of demand, the market continues strong and business is excellent. All indications point to more business during 1905 than for several years, possibly more than ever before in the history of the trade.

Pig Iron.—The market is strong, and, although prices show little change, the tendency is upward. Buyers do not object to advances recently made and are anxious to place orders. Weather conditions may have an important effect on the market. Rain is badly needed. We quote as follows: No. 1 X Foundry, $17.50 to $17.75; No. 2 X Foundry, $17.25 to $17.50; No. 2 X Plain, $16.50 to $17; Gray forge, $15.75 to $16.25; Basic, $15.50 to $16.

Finished Material.—Mills are entering all the orders they care for and are declining some for fear that specifications may not come in promptly. The announced advances in plates, shapes and bars are about as expected. We quote delivered: Refined bar iron, 1.63½c; tank plates, steel, 1.63½c; angles, beams and channels, 1.63½c; steel bars, 1.65c.

Old Material.—Some sellers are disposed to make slight concessions and the market is easier, but by no means weak. We quote: No. 1 steel scrap, $16 to $16.50; low phosphorus scrap, $19.50 to $20; old steel axles, $19 to $19.50; old iron axles, $23 to $23.50; old iron rails, $20 to $21; old car wheels, $14.50 to $14.75; choice R. R. No. 1, wrought $19 to $19.50; machinery scrap, $15 to $15.50; wrought turnings, $12 to $12.50; cast borings, $9.50 to $10; stove plate, $13 to $13.50; wrought iron pipe, $14.50 to $15.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, NO. 150 NASSAU ST., DEC. 20.

Interest chiefly centered during this week in the meetings of the various steel pools at Jersey City. Yesterday the beam and billet pools held a protracted session, which terminated with an advance of $2 per ton in structural shapes. The billet pool decided to make no change in prices for the present, but it is said that not many weeks will elapse before an advance of about $2 per ton will be ordered. The bar pool fixed the prices at 1.40c Pittsburg for both Bessemer and open hearth, the former price having been 1.30c for Bessemer and 1.35c for open hearth. The plate pool fixed the price of plates 6¼ to 14 inches at 1.40c and other plates 1.50c. The former prices were 1.30c for plates 6¼ to 24 inches and other plates 1.40c.

Pig Iron.—From the standpoint of sales, the local pig iron market for the past week did not come up to the week previous. During the past two days, however, there has been an influx of inquiries, aggregating about 30,000 tons. The most of this is for foundry grades, giving the impression that foundrymen are beginning to share in the improvement that has taken place in other lines. Northern irons are being held at an advance of 25 cents per ton over last week's quotations. Sales of No. 2 foundry have been made at $16.75 at Eastern Pennsylvania furnaces, and it is doubtful if consumers could improve on this figure at present. There was a little more Southern iron changed hands during the past week than for some time past, with quotations ruling strong at $13.50 Birmingham for No. 2 foundry. No imported iron has as yet been contracted for in this market. New York quotations at tidewater follow: Northern No. 1 foundry, $17.75 to $18.00; No. 2 foundry, $17.25 to $17.50; No. 2 plain, $16.75 to $17.00; Southern No. 1 foundry, $17.50 to $17.75; No. 2 foundry, $17.00 to $17.25; No. 3 foundry, $16.50 to $16.75; No. 4 foundry, $16.00 to $16.25.

Rails.—Definite information concerning sales for 1905 is difficult to obtain. Outside of the 102,700 tons purchased by the Pennsylvania railroad it is known that the Michigan Cen-

tral has placed an order for 100,000 tons, divided evenly between the Lackawanna and Illinois Steel Companies. The latter is said to have orders on hand for 150,000 tons. Through the Southern Supply Co., the Tennessee Coal and Iron Co. has received an order for 15,000 tons. There are several large orders likely to be placed any day.

Finished Iron and Steel.—There has been only a moderate business in structural shapes during the past week. Orders taken by the American Bridge Co. include 1,700 tons for a building in Louisville, and 500 tons from the Atchison road. There are some very good inquiries for structural shapes in the market, especially from railroads, the latter including 12,000 tons from the New York Central Railroad and 6,000 tons from the Lackawanna Road. Trade in bars keeps up very well, with the outlook improving also. In plates there is a steady run of orders, making up an excellent tonnage. Sheets are in fair demand. New York prices at tidewater follow: Angles, 3 to 6 in. x ¼ in. and heavier, 1.64½c; beams, 3 to 15 in., 1.64½c; channels, 3 to 15 in., 1.64½c; beams, 18, 20 and 24 in., 1.74½c; tees, 3 x ¼ in. and heavier, 1.69¼c; plates, carloads, tank, 1.54½c; flange, 1.64½c; marine and ordinary fire box, 1.74½c; refined iron bars, 1.54½c to 1. 64½c; soft steel bars, 1.44½c to 1.54½c; sheets, in carload lots, New York, No. 28, black, 2.40c to 2.45c; galvanized, 3:55c to 3.60c.

Old Material.—Actual sales fell off during the past week, but prices continue as strong as at any time since the upward movement set in. Holders show an indisposition to sell, and await the advent of the new year, with the belief that values will reach a higher level than now. Approximate prices are f. o. b. cars as follows:

Old iron rails	$17 00 to 18 00
Old steel rails, long lengths	15 50 to 16 00
Old steel rails, short pieces	15 00 to 15 50
Relaying rails	20 00 to 21 00
Old car wheels	14 50 to 15 00
Old iron car axles	20 00 to 21 00
Old steel car axles	17 00 to 18 00
Heavy melting steel scrap	15 50 to 16 00
No. 1 railroad wrought scrap	17 00 to 18 00
	15 00 to 16 00
Iron track scrap	12 00 to 12 50
Wrought pipe	11 00 to 12 00
Ordinary light iron	7 00 to 8 00
Cast borings	9 50 to 10 50
Wrought turnings	12 75 to 13 25
No. 1 machinery cast	10 50 to 11 50
Stove plate	

BIRMINGHAM.

Dec. 20

Alabama iron manufacturers have been selling their product right along in greater tonnage than they are producing. Sales have recently been recorded for iron to be shipped into northern territory, Pittsburg alone buying 1,500 tons mill iron in one lot, paying $12.75 at furnace. It is stated that a few small sales have been made, delivery in the first two months of 1905, on a basis of $14 for No. 2 foundry. The greater portion of the make of iron for the first three months of the coming year has been sold. The production is not as active as it might be. The Alabama Car Service Association has given notice to the furnace companies, as is done every year, that there will be no demurrage charges on cars used for the raw material supplies held overtime during the holidays and the iron manufacturing companies can use cars for their surplus stock to provide a steady operation at the furnaces, though the work at the mines, quarries and coke ovens should lag.

The following prices for pig iron are given, quoted by furnaces: No. 1 foundry, $14 to $14.25; No. 2 foundry, $13.50 to $13.75; No. 3 foundry, $13 to $13.25; No. 4 foundry, $12.50 to $12.75; gray forge, $12.25 to $12.75; No. 1 soft, $14 to $14.25; No. 2 soft, $13.50 to $13.75.

The five Tennessee furnaces at Ensley are still making basic iron for the steel plant. Two furnaces at Bessemer are in operation on foundry iron. The Alabama Consolidated Coal & Iron Co. has three furnaces in blast; Sloss-Sheffield Steel & Iron Co., five; Tutweiler Co. and Lacey-Buek Co., one each; Woodward and Republic Iron & Steel Co., two each; Lookout Mountain Iron Co. and Central Iron Co., one each.

The production of steel and steel rails at Ensley is greater right now than it ever was. The company will make extensive repairs about the steel plant during the coming year. It is proposed to make additions so that the production can be increased 50 percent.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., DEC. 20.

Pig Tin.—The feature of the week has been the collapse of the "squeeze" in London, which has played havoc with trade there. The collapse came today when spot sold off £4 and futures £1, causing the market here to decline, with a weakening tendency at the close. In trade circles today many were talking lower prices for the new year, with prices for futures here and abroad, together with the adverse statistical situation which exists, pointing that way. Today's closings follow: Spot, 28.70c to 28.90c; December, 28.50c to 29.00c; January, 28.40c to 28.80c. London's closings today follow: Spot, £131 10s; futures, £129 10s. Arrivals at Atlantic ports for the month to date aggregate 1,207 tons, with 2,935 tons afloat.

Copper.—The past week has been featureless. Sales made have been of a moderate character, with prices remaining unchanged. The outlook is thought to favor lower than higher prices, at least so far as the immediate future is concerned. The London market for the week has been dull, with prices unchanged. Today's closings follow: Lake, 14⅞c to 15⅛c; electrolytic, 14¾c to 15c; castings, 14½c to 14¾c. London's closings today follow: Spot, £66; futures, £66 7s 6d. Exports for the month to date aggregate 8,167 tons.

Lead.—Remains quiet and unchanged at 4.60c to 4.70c for spot. St. Louis is firm at 4.55c to 4.62½c, according to brand. London is slightly weaker at £12 12s 6d.

Spelter.—Is dull and without interest at 5¾c to 5⅞c. St. Louis remains at 5.70c. London is lower at £24 15s.

Antimony.—All grades declined during the week. Cookson's to 9.00c to 9.25c, Hallett's to 8.75c to 9.00c, and other brands, 7.75c to 8.25c.

Quicksilver.—We quote $40 per flask of 75 lb. in lots of 100 flasks. London is £7 15s.

Nickel.—Sales are made at 40c to 47c for large lots down to a ton, and at 50c to 60c for small quantities.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, DEC. 20.

The holiday season has interfered with demand for metals, and the market is correspondingly quiet. Consumers are also using up stocks on hand on account of the closeness of the inventory period. Prices, however, are firm, and no changes have been made, with the exception of pig tin, which is 1 cent higher. We quote as follows: Lake copper, in carloads, 15¼c; in less than carload lots, 15½c to 15¾c; casting copper, 15⅛c for carloads, and 15½c for smaller lots; pig tin, carloads, 30¼; lesser quantities, 30¾c. Sheet zinc, 6.75c for carload lots of 600-lb. casks, and 7¼c to 7⅝c for less than carload lots. Pig lead, 4.60c for 50-ton lots, 4.75c for carload lots, and 4.90c to 4.95c for smaller quantities. Spelter, 5¾c for carload lots, and 6c for lesser amounts.

There is a fair demand for old metals and prices are holding up well. We quote dealers' prices as follows: Copper wire and heavy, 12¾c; copper bottoms, 11½c; copper clips, 12¼c; red brass, 11½c; red brass borings, 9¾c; yellow brass, heavy, 8½c; yellow brass borings, 7½c; light brass, 6¾c; tea lead, 4c; zinc, 4c.

LARGE ORDER FOR CARS.

The *Railway Age* states that there are now about 60,000 cars booked by the contract shops of the United States and that there are over 40,000 cars being considered by railway companies, of which probably half will be ordered within a few weeks. The *Railway Age* believes that it is a safe prediction that orders for the year will exceed in number those placed last year, when about 111,000 cars were ordered. The year 1902 has the record, orders aggregating 198,700 cars having been placed. A maintenance of the present business for but a few months will insure that 1905 will be a prosperous year for car builders and supply men.

Among recent orders for cars were the following: Of the American Car & Foundry Co., Central of New Jersey, 500 box cars; Tierson & Co., New York, 50 freight cars; New York Central, 1,000 box and 500 other cars; Chicago, Rock Island & Pacific, 250 ballast cars; Minneapolis, St. Paul & Sault Ste. Marie, 150 ballast cars; Pennsylvania Lines, 1,794 cars; Southern Pacific, 300 double deck stock cars, 300 steel under frame box cars, 700 single deck stock cars and 200 steel stock cars; The Delaware, Lackawanna & Western, 1,000 box cars and 500 steel hopper coal cars; of the South Atlantic Car & Mfg. Co., Central of Georgia, 500 cars; of the South Baltimore Steel Car & Foundry Co., Delaware, Lackawanna & Western, 200 refrigerator cars; of the Pressed Steel Car Co., Cambria Coal Co., 100 cars; of the Standard Car Co., Duluth, Mesabi & Northern, 800 steel hopper cars; of the Pullman Co., Southern Pacific, 13 dining cars, five observation and smoking cars; of the National Coal Dump Car Co., Illinois Central, 450 dump cars. The Canadian Pacific will build 2,000 cars in its own shops.

Among recent orders for locomotives were the following: Of the American Locomotive Co., Pennsylvania Lines, 15; of the Baldwin Locomotive Works, New Orleans Terminal, three; Pennsylvania Railroad 15; Duluth & Iron Range, four; Detroit Southern, three; of the Locomotive & Machine Co., Canadian Northern, five.

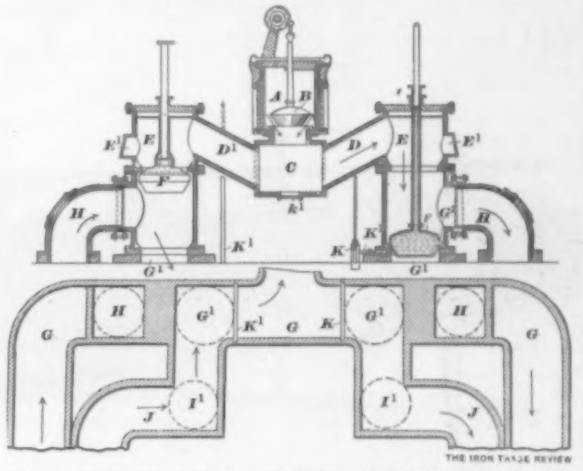
The *Railroad Gazette* says: "The increase in orders is in part the indirect result of a rather poor year in 1903, and some of the contracts recently placed were undoubtedly held over from last year because many of the railroads found it so hard to secure the necessary money that they preferred to get along with what equipment they had, at a time when gross earnings were slackening. The situation this year is the reverse, and it is now possible to obtain sufficient money for equipment at reasonable rates. The tremendous recovery in the market value of the more important equipment companies from the low prices of 1903, shows the disparity between the orders on hand last fall, and the orders now on hand. In December, 1903, many of the equipment companies were running their shops with half their forces, and with only a meager amount of orders on their books. In direct contrast to this, many of the works are now running full force with orders booked ahead. Carefully compiled figures show that during the past two months orders have been placed for 60,000 cars and about 80 locomotives. The greater part of these orders will not show in the year's output, as they will not be finished until the first part of 1905. In fact the estimate for the car and locomotive output for 1904 will probably fall far short of the figures for 1903. Present indications point to a general revival in business and heavier traffic in 1905, and orders for new equipment and rolling stock should show a steady increase from now on, to meet the prevailing larger traffic movement."

The Logan Mfg. Co.'s property at Phoenixville, Pa., has been sold to the bondholders for $50,250. It is subject to a mortgage of $50,000. The company was organized about eight years ago for the manufacture of steel castings. Its president is George F. Huff.

NEW VALVE FOR REGENERATIVE FURNACES.

A device which has been patented by Mr. H. W. Henderson, 3 Dalmarnock street, Glascow, and which is about to be installed in a Scottish steel works is described by the London *Iron and Coal Trades Review*. It relates to the reversing arrangements in regenerative steel furnaces. The arrangement is illustrated in section and plan, Figs. 1 and 2, herewith. The gas is admitted into a chamber A which is fitted with two semi-circular hinged lids provided with fire-clay flanges. From thence the gas passes through a mushroom valve B into a chamber C provided with a hinged lower door C^1 and a side soot-removing trap door, and traverses an inclined flue D or D^1 as the case may be, into a vertical chamber E fitted with hinged soot-removing doors E^1, which also act as safety valves for exit of any air. These vertical chambers are provided with duplex-shaped mushroom valves F which cover ports G^1. Through these the gas passes by way of curved branches H into the main gas flue G.

The air is admitted through a port 1^1 provided with a mush room lift valve 1, and passes along the usual flue J, as shown on the right hand side of Fig. 2, to the gas and air regenerative chambers, from which the gases pass into the furnace.



FIGS. 1 AND 2.—SECTIONAL ELEVATION AND PLAN OF NEW VALVE ARRANGEMENT FOR REGENERATIVE FURNACES.

The waste gases from the furnace pass through the gas and air duplicate flues G and J, shown to the left of Fig. 2, and through the exit flue to the draught chimney, the air valve I being closed, and the gas valve F closed at top and open at bottom, as shown in Fig 2. Damper plates or valves K, K^1 are provided in the main flue so as to close K at the entrance to the chimney flue at the entrance of the gas, and open same at K^1 at the exit of the waste gases.

The gas valves and dampers are controlled by chains passing over guide pulleys and attached to counterweights, and the air valves by chains attached to levers. If desired, the valves F and K can be made hollow, as shown in the right-hand side of Fig. 1, so that water can circulate through them. Water can also be admitted to a passage in the upper seat of the valves F. The lower seat is built up of overlapping segments of firebrick.

The LaBelle Iron Works, of Steubenville, O., recently purchased from the Weimer Machine Works Co., of Lebanon, Pa., one of its latest style automatic dump cinder cars, double connected truck type, and this has been followed by orders for four more cars. The manufacturers have also completed an order for three automatic dump cinder cars and five hot metal cars for the Wharton Furnaces, Wharton, N. J., and have recently installed a 50 x 96 x 60-in. blowing engine at the furnace of the Robesonia Iron Co., Ltd., Robesonia, Pa.

The Cleveland Furnace Company's Plant.

One of the interesting features of the last campaign of blast furnace building that reached its height in 1902, was the erection of a number of well-equipped furnaces on the shores of Lake Erie. Two considerations were prominent in the minds of those who promoted these enterprises—the advantages in low cost of assembling materials at a point where ore could be unloaded from vessel into furnace yard, and the proximity of important consuming interests, to whom the expense of delivering iron was low, often being nothing more than a switching charge.

The blast furnace of the Cleveland Furnace Co., which has now been in operation something more than a year, is among the successful Lake Erie stacks, and its equipment and methods merit description in detail. The members of the firm of Rogers, Brown & Co., who took the initiative in the project, decided in March, 1902, to form a company to build a furnace at a Lake Erie site and after a careful canvass of the advantages of various points Cleveland was selected.

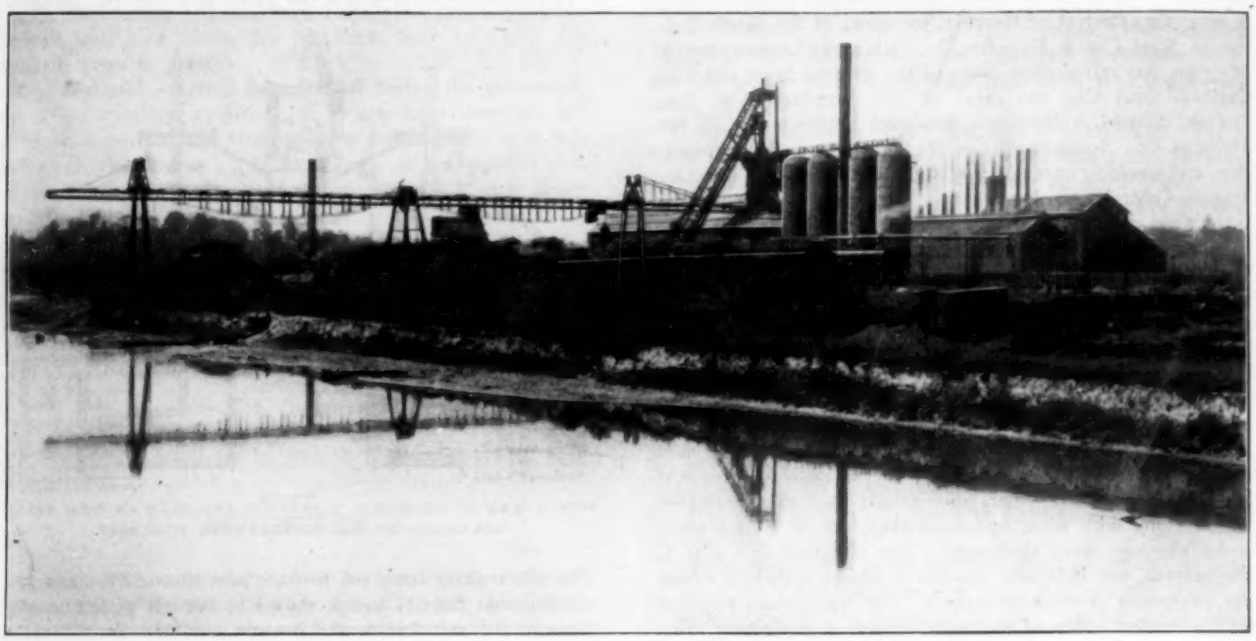


FIG. I.—CLEVELAND FURNACE CO. GENERAL VIEW OF ORE YARD AND FURNACE PLANT.

Rogers, Brown & Co., as agents, had been selling for years large quantities of pig iron in and about Cleveland and in view of the constantly increasing demand from mills and foundries in that district decided to enter the field as manufacturers. A few years previous a number of Cleveland capitalists interested themselves in a project to build a blast furnace and a plant of by-product coke ovens in the upper Cuyahoga river valley and had acquired options on land in the vicinity of Clark avenue. Owing to unexpected circumstances these options were allowed to expire, and the projectors of the Cleveland Furnace Co. readily secured them, and by adding some other land concluded a purchase of about 175 acres with 1¼ miles of Cuyahoga river frontage. The city authorities, recognizing the importance of the enterprise and the development of the upper river valley likely to follow at once, assured the projectors that the river would immediately be made navigable through this property, and have since taken steps to straighten and dredge the river. This work is now well under way. The location is an unusual one in that it could scarcely be expected that so large an unoccupied tract could be found within 2¼ miles of the business center of such a city as Cleveland. There was neither wagon road nor building on the entire tract.

In addition to the excellent shipping facilities afforded by navigable water, the furnace is directly on the B. & O. system, and reaches the Wabash through the Wheeling & Lake Erie. The Cleveland Belt line and the Newburg & South Shore Railway, as belt lines, connect with every line in the city, the Newburg & South Shore also facilitating the transportation of hot metal from this plant to the Newburg steel works of the American Steel & Wire Co., Cleveland, besides being one of the largest consumers of foundry and malleable pig iron in the country, lies in the heart of the "zone of iron" bounded by Buffalo, Pittsburg, Wheeling and Lorain, considered by some students of the problem, to have precedence as an assembling and distributing district, in iron and steel manufacture.

Ore Unloading Arrangements.

The Cuyahoga river not being navigable to the site of the new furnace a temporary dock arrangement was made pending the completion of the dredging by the city of Cleveland. The furnace company leased from the W. & L. E. Railway Co. 600 ft. of dock near Mahoning street, about one mile nearer the lake, and constructed thereon a "fast plant" consisting of two Brown 5-ton automatic grab bucket unloaders. These machines have a capacity of one trip per minute, being 300 tons per hour in free ore, and to them were added an electric power plant and Andrews' scraping devices whereby boats may be entirely unloaded without any shoveling, and at a very much faster rate than with the old-fashioned bucket machines.

To transport this ore to the furnace 25 50-ton dump cars were bought of the Ingoldsby Automatic Car Co. These cars are of a new design and are like a Howe truss as to strains. The entire bottom drops out, and they discharge instantly. They may even be discharged while running at the rate of 25 miles an hour, the entire load being left free from the rails.

The Bin System.

When the ore arrives at the furnace it is dropped by the dump cars through the trestle, to be stored for winter by a Brown man trolley bridge, described below, or is put directly into bins for immediate use. The bins run along the front of the yard, parallel to the cast house, and have a

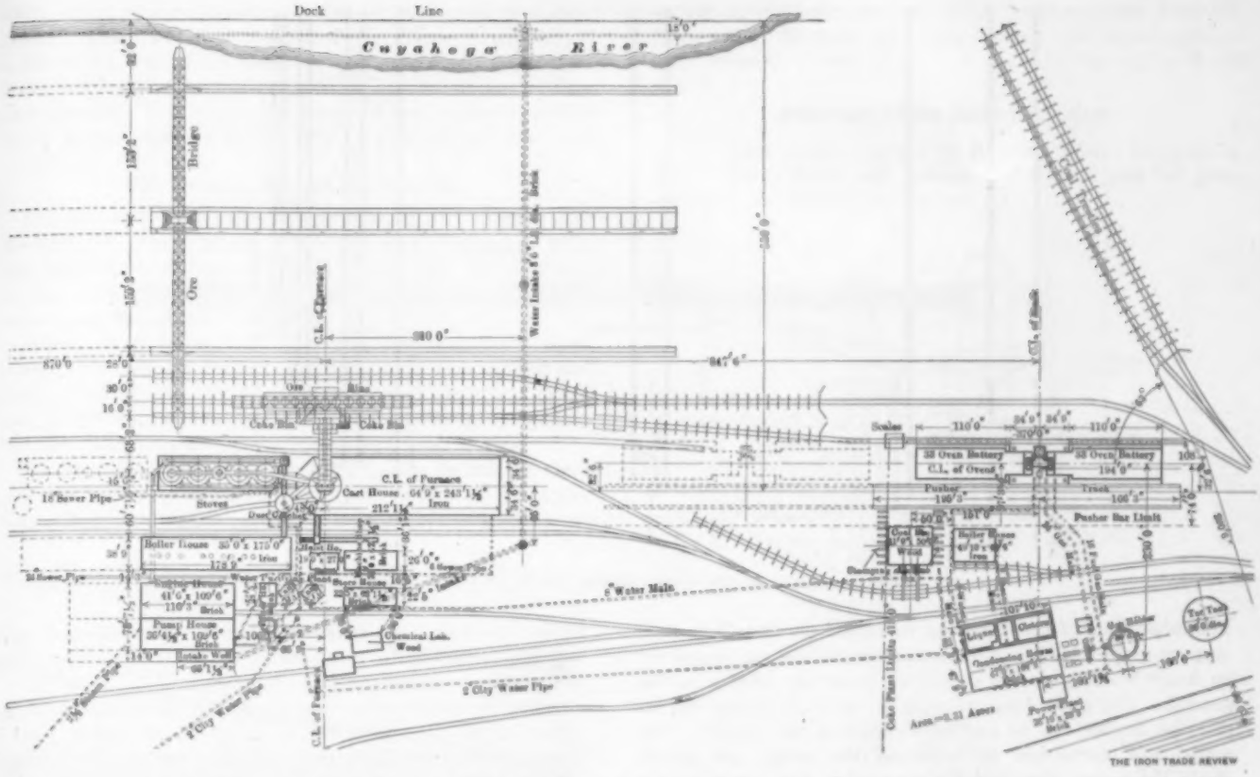


FIG. 2.—CLEVELAND FURNACE. PLAN OF ORE YARD, BIN SYSTEM, BLAST FURNACE AND COKE PLANT.

length of 144 ft. The bins are in the modified form of the Brown patent parabolic type, and are equipped with the regular Brown system of chutes, gates and gate operating mechanism. The bin is divided into twelve pockets, which have a capacity of about 50 tons each or ore, or about 33 tons of limestone. There are railroad tracks on top of the bin, and ore and limestone can be brought in in bottom dump cars, and dumped directly into the bins.

The coke bin is built in around the hoist incline. It has a capacity of about 250 tons of coke, and is arranged with a spout and gate on each side, so that the coke can be drawn off directly into the skip car on each track of the double incline hoist. Railroad tracks are also provided on top of this bin, and the coke is unloaded directly from the cars into the bin.

Running on tracks underneath the bins and over the skip car pit, is a system of larries, operated electrically, which take the material from any pocket along the bin, weigh it and then transfer and dump it into the skip car. There are two 75-cu. ft. buckets or pockets on each larry. A motor and a portion of the mechanism for operating the gates underneath the main bins are also placed on the larries, the portion carried on the larries being connected with the portion which is permanently fixed to the bin gate, by means of a male and female coupling attached to a short vertical shaft. This mechanism, as well as the weighing mechanism and the operating of the door of the larry buckets, is entirely controlled by one operator on the larry, who also controls the movement of the larry itself, along its runway tracks. Running along in front of the storage bins, is a trestle used for unloading the ore and limestone as it is received in the yard, in case it is not unloaded directly into the bin. The material is dumped through this trestle on to the ground, from which point it is handled by the bridge crane.

Bridge Crane.

The Brown bridge crane is used for taking the material from the unloading trestle, and carrying it back to any portion of the storage yard; and also for taking the material from the storage yard, and depositing it in the bins at the furnace. The crane is 450 ft. long, and consists of two spans of 156 ft. each; with a cantilever of 88 ft. at the furnace end, and one of 48 ft. at the river end. The crane is supported at the center, on a pier running on two lines of track, 20 ft. centers.

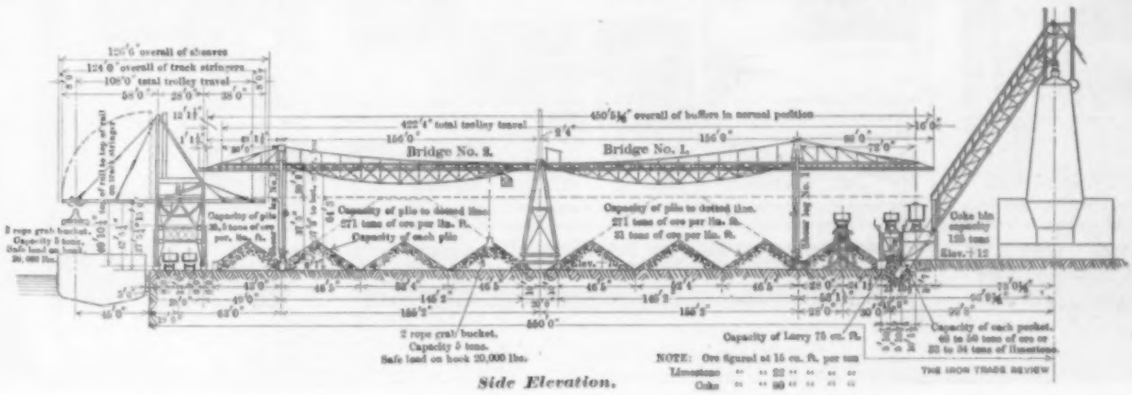


FIG. 3.—ELEVATION OF ORE YARD EQUIPMENT, WITH DETAILS OF BRIDGES AND ORE CAPACITY.

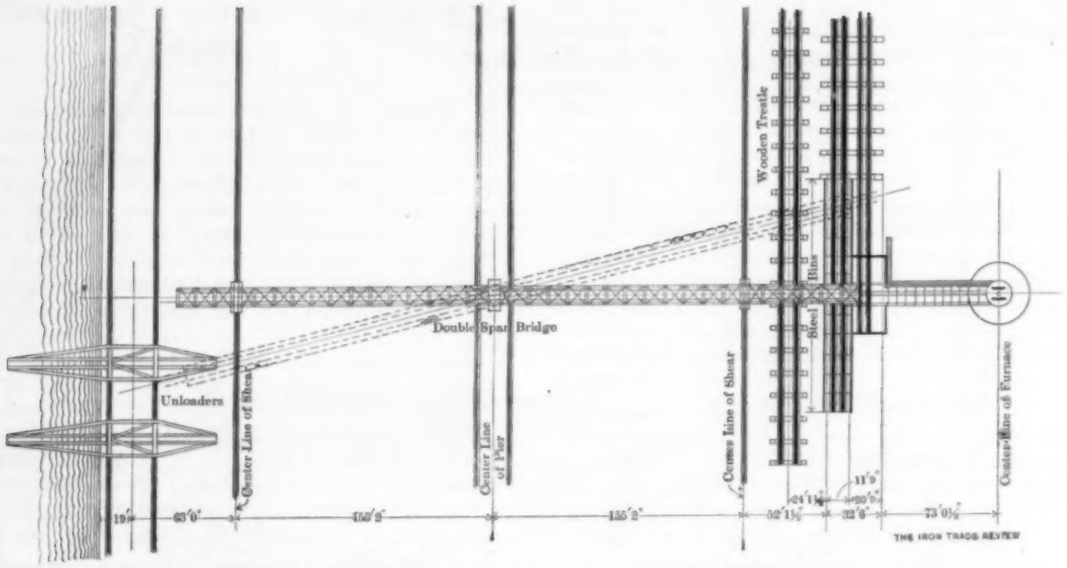


FIG. 4.—PLAN OF ORE YARD, BRIDGE CRANE AND BIN SYSTEM.

The other ends of the spans are supported on shear legs running on single tracks. The tracks themselves are supported on heavy timbers resting on cross ties, firmly bedded in the ground. The shear legs are entirely open above the sill, so that the bucket can be carried through at any height. The motor and mechanism for traveling the bridge, are placed above the center pier, and the controllers for operating this mechanism are suspended near this point in such a position that the operator can reach them without leaving his cab on the trolley. The bridge can be skewed in either direction, through an angle of about 14 degrees, or in the length of the crane through a distance of about 100 ft. This allows material of different kinds to be placed in the various pockets of the bin, without moving the crane for each load.

What is known as a man trolley, is used on the bridge. That is, the operator rides in a cab on the trolley, and is thus directly over his work at all times, and is able to watch all the operations. This one man performs all the operations of moving the bridge, traveling the trolley back and forth, and operating the bucket. The bucket is of the regular Brown two-rope type, having a capacity of five tons. The storage yard is arranged so that eventually, ore can be brought in in

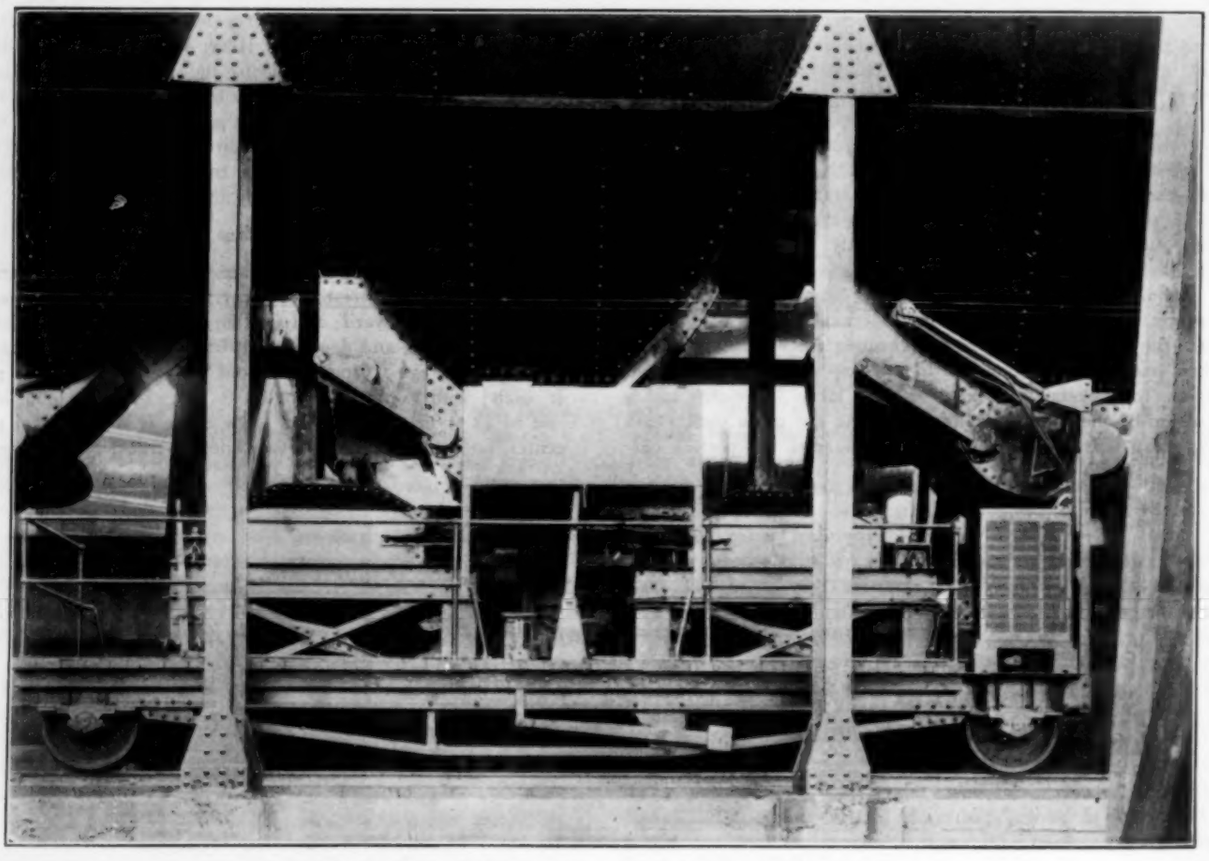


FIG. 5.—ORE TRANSFER LARRY AND BROWN PARABOLIC BINS.

boats, which will be unloaded by two or more unloading machines. These will deposit the material either in cars or in a pile at the rear of the machines and underneath the bridge, from which point the material will be handled by the bridge, as at present. The length of the yard is about 1,500 ft., and it has a storage capacity in the neighborhood of 4,000,000 tons of ore

The Furnace and Top Construction.

The material is all raised to the top of the furnace and dumped into it by a double skip arrangement. The two bells are operated by plungers directly above them, in which oil is used under pressure. This system commends itself especially, as the plungers hold the bells up by virtue of the pressure. In lowering, it is merely necessary to pull a lever opening a valve and the bells lower by their own weight and come gently to rest. They are raised just as easily and closed just as gently, thereby preventing the loosening of the top and the extra strains of the steam operating outfits.

The furnace, designed by Julian Kennedy, consulting engineer, of Pittsburg, is 85 x 20 ft., 13 ft. hearth, 14 ft. stockline, 9 ft. bell, with the Julian Kennedy tight top without ex-

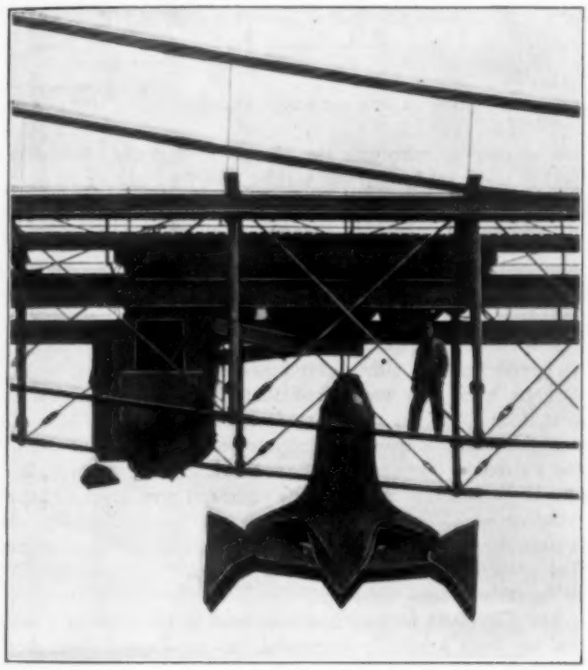


FIG. 6.—VIEW OF CAB ON BRIDGE CRANE AND BROWN TWO-ROPE GRAB BUCKET.

plosion doors. There are two bleeders, only one of which is used.

Both large and small bells are operated from the stock line by oil in plungers under hydraulic pressure. This oil is usually under 500 to 600 lb. pressure per sq. in., compressed by two Stilwell-Bierce duplex plunger pumps and equalized by an accumulator, all of this machinery being in the engine house.

There are two dust catchers, one large and one small one. The furnace bosh is especially heavily bound and fitted with 10 rows of Scott plates between mantel and tuyeres, with four rows of iron plates above the mantel. The furnace has eight columns and 12 6-in. tuyeres. There are three cinder notches, only one of which is used. The others serve only in case of special requirements. Cinder is handled by Weimer ladle cars.

The cast house is 200 ft. long by 66 ft. wide and has a particularly sharp pitched roof.

The stoves are of the Kennedy type, 90 x 22 ft., having central combustion chambers. The fittings include Berg hot blast valve, Kennedy cold blast valves and Morrison-Kennedy chimney valves. The draft stack for the stoves is 160 x 6 ft.

Boiler and Engine House Equipment.

The boiler house is 175 x 35 ft. and contains 12 250-h. p. Cahill boilers fitted with vertical gas burners and full grate area for coal firing if necessary.

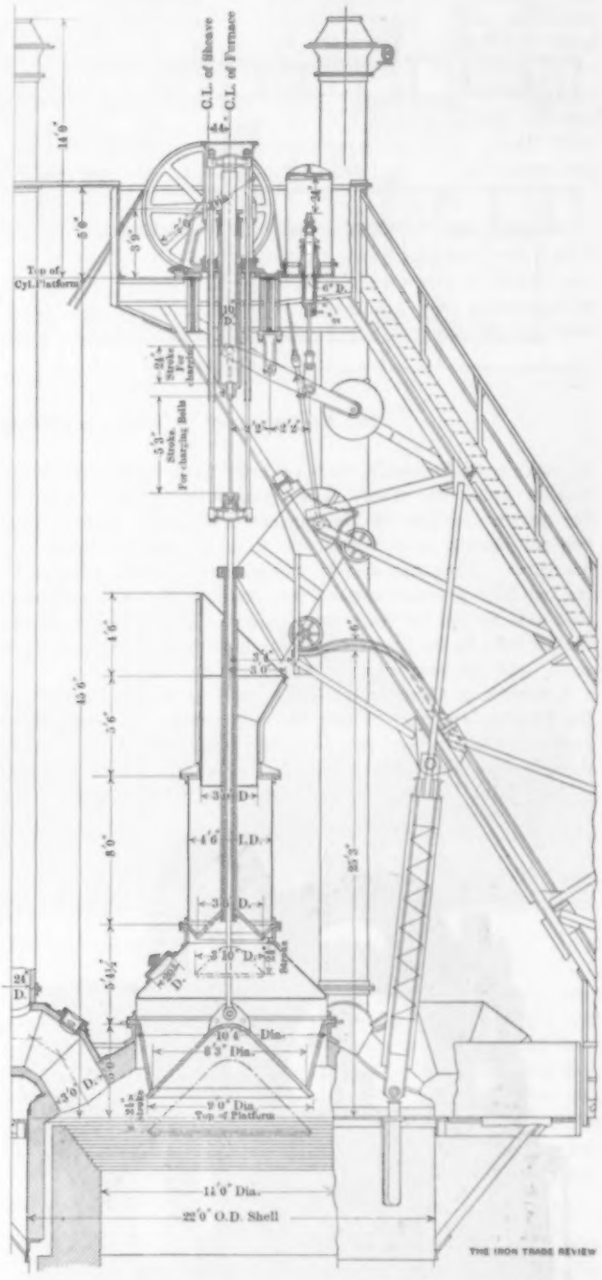


FIG. 7.—GENERAL ARRANGEMENT OF FURNACE TOP.

The steam lines are fitted with forged steel flanges and the lines above the boilers are divided into three equal parts by the connections running to the engine house. These connections enter at each end and are connected in loops, so that in the event of almost any accident to the main steam lines the closing and opening of a few valves would keep the plant running nearly full capacity even though one-third of the boiler capacity were disabled.

There are three quarter-crank high-speed Mesta blowing engines, two high pressure and one low, coupled so as to run singly, any two, or all three, simple, compound or compound condensing. The design of the engines, placing the cylinders on one level, eliminates the necessity of dismantling an engine to make a slight repair, each cylinder head being readily accessible under the crane. The arrangement of the cranks on the quarter permits of high speeds with good results, these engines having been run at 70 r. p. m. against heavy air pressures. They can also be run at equal speeds, compounding two high pressure engines into one low, and with considerable ease to the air lines and engines. The stroke is 60 in., the air tubs 84 in. diameter, the high pressure steam cylinder, 44 in., and the low pressure steam cylinder, 84 in.

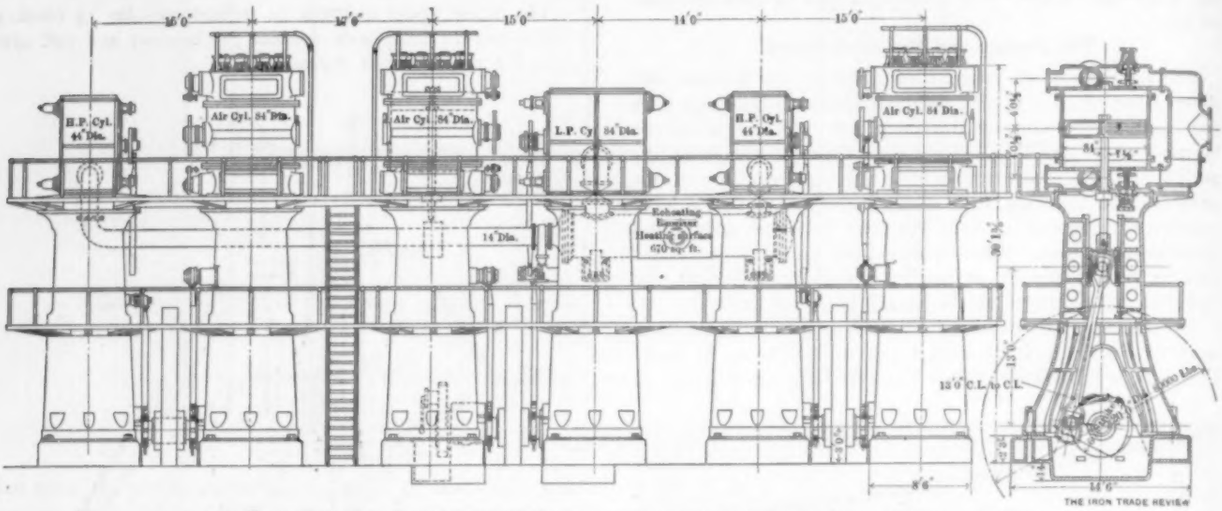


FIG. 8.—ELEVATION OF BLOWING ENGINES, WITH SECTION THROUGH ONE BLOWING CYLINDER.

A 6,000-h. p. Conover condenser receives all the steam from the blowing engines. There are two compound duplex feed pumps for boilers, and two Jeansville compound duplex rotary valve pumps for water service, having a capacity of 4,000,000 gallons daily. A 48-in. brick intake well delivers water from river to a rectangular well into which pump and condenser suctions dip direct. A 4,000-h. p. water purifying plant protects the boilers from scale.

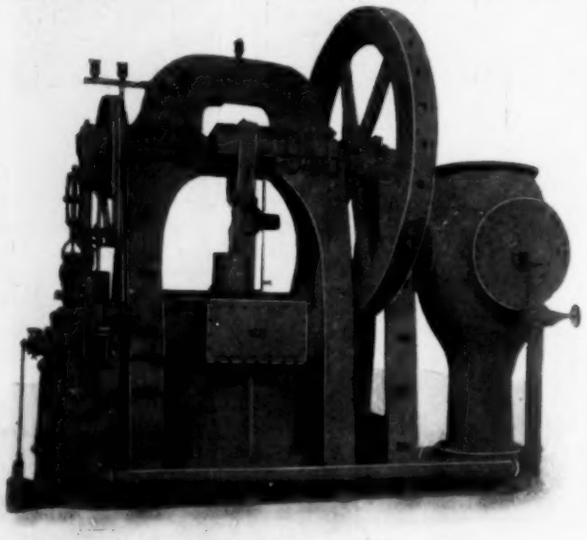


FIG. 9.—6,000-H. P. CONOVER CONDENSER.

The electric equipment consists of two 250-k. w. Westinghouse generators, 220 volt, direct current, driven by direct connection to Erie City Iron Works simple high speed engines.

An enclosed Pittsburg feed water heater receives the exhaust steam from the generator engine, oil and water pumps, and this heats the feed water. Electricity is used mainly in the larries, in collecting the charge in the stock-house and by the large bridge for all service and for lighting.

The Iron Yard.

A feature of the general design of this plant is the railroad arrangements. A yard was designed for the handling of materials and a furnace was fitted to it. The iron yard has been laid out with reference to the care and selection of irons for special wants. There has been no attempt to handle iron in either cast house or in iron yard by machinery, as it was considered that the careful selection required by foundries will not admit of it. All cars of whole pigs are weighed from furnace into yard over a track scale of the Fairbanks suspended and automatic registering type, having all knife edges and bearings overhead free from dirt, rust and the shock of the running of the cars. All pigs are broken by throwing on breaking blocks, picked up, selected and graded, and either loaded at once for shipment or piled in separate grades for stock.

The Cleveland furnace has now been in blast nearly a year, and has been unusually successful, having shipped some thousands of tons of Bessemer, malleable and foundry irons, and making some specialties, such as car wheel iron, special strong irons and soft Scotch irons. The furnace is credited with holding a record for largest daily average tonnage of high silicon foundry iron.

By-Product Coke Plant.

A by-product coke plant was also built by the Retort Coke Oven Co. and will supply the furnace plant with all its coke, besides having a large quantity of gas for power and illuminating purposes. The location of the coke plant with reference to the furnace and the details of buildings and machinery are indicated on the plan view. There are two batteries of 33 ovens each and accompanying equipment for stamping and ramming the coal, with the necessary complement of by-product buildings, liquor cistern, condensing house, gas and tar holders, etc.

D. B. Meacham, of Rogers, Brown & Co., is president of the Cleveland Furnace Co.; S. W. Croxton, of the Penn Iron & Coal Co., vice president; C. Birdsall Smith, secretary and treasurer, and D. T. Croxton, general manager. The sales and manager's offices are in the Perry-Payne Bldg., Cleveland, and the general office at the works on Clark avenue.

OUTPUTS AT BRITISH FURNACES AND MILLS.

In his presidential address at the recent meeting of the Cleveland Institution of Engineers, R. J. Worth, of Stockton-on-Tees, Eng., reviewed the progress made in engineering and iron making in the past forty years, the period during which he had been connected with the district. Referring to the blast furnace he said that forty years ago the height of the furnace was about 65 ft. blast pressure 3 to 4 lb. heated in pipestoves to 800° or 900°, and the average make was 220 tons per week with a consumption of coke of from 24 to 25 cwt. per ton of iron. The engines were all non-condensing, and 60 lb. was something like the maximum pressure. The boilers were mostly of the plain cylindrical type, now obsolete, though there were some Cornish in use, and a year or two later Messrs. Whitwell put down some Elephant boilers, then a favorite type in France. At the present time the standard height of the Cleveland furnace was 85 ft., other dimensions varying, the blast pressure 6 to 7 lb., the temperature of the blast heated in fire brick stoves from 1,100° up to 1,400°, and the make of pig iron for the week ending Oct. 15 averaged 760 tons of Cleveland iron per furnace per week. But it was evident that many were below that. The average of the three furnaces making Cleveland iron at Newport Iron Works during the six months ended Sept. 30 last was 1,272 tons per furnace per week, the maximum make of one furnace for one week being 1,459 tons. The consumption of coke was 22 1-4 cwt. to a ton of iron, but a large portion of this was retort coke. The North-Eastern Steel Co., at its Acklam blast furnaces, Middlesborough, had also gone in for large makes. The blowing engines are compound-condensing, blowing from 10 to 12 lb. pressure, and capable of doing up to 15 lb. The average output over six months was 1,316 tons per furnace per week, and the best make of one furnace 1,644 tons. At Clarence Iron Works, Middlesborough, during the first eight months of this year the average per furnace per week on all Cleveland ore was 1,164 tons, and the best 1,324 tons; on two-thirds Cleveland and one-third foreign ore the average was 1,498 tons, and the best 1,552 tons.

Referring to plate mill operation, the speaker said that the maximum make at Witton Park in 1862 was 14 tons per shift, whereas now about 160 tons of steel plates were frequently rolled per shift in one mill; but in spite of that there was not a mill in the district or in England which was doing anything like what modern machinery was capable of, and what is reported to be done in America. For one thing, British mills were far too much cramped for room, and if the mill were kept fully fed with steel there was not nearly enough room in which to put the plates, and the arrangements for dealing with the plates after they were rolled might fairly be described as primitive.

The affairs of the Sandage Steel Skein Co. of South Bend, Ind., are being adjusted with the assistance of the court, and the concern will soon cease to exist. The debts will be paid in full. Stock which had a par value of $122,500 passed into the hands of Joseph F. Davidson, president of the American Skein & Foundry Co., Racine, Wis., the consideration being $24,500. The Racine company is allowed to remove at its own expense all the machinery, stock, etc., from the South Bend plant. The real estate of the defunct company, together with the buildings, will be transferred to the National Wire Bound Box Co., a corporation which is already occupying a part of the building.

The Goulds triplex boiler feed pump, operated by a 40-h. p. electric motor, located in the boiler house of Machinery Hall at the World's Fair, St. Louis, has been purchased by the Lewis and Clarke Exposition Co. to be used for the same purpose at the exposition to be held at Portland, Ore., next year. The Goulds Mfg. Co. of Seneca Falls, N. Y., was awarded a gold medal for this pump, which supplied feed water for boilers of 4,000-h. p. in the boiler house that furnished the power for Machinery Hall. This company was also awarded three other gold medals; one for its exhibit in Machinery Hall of power pumps and one each for the exhibit of hand pumps and sprayers and spray fittings in Horticultural Hall.

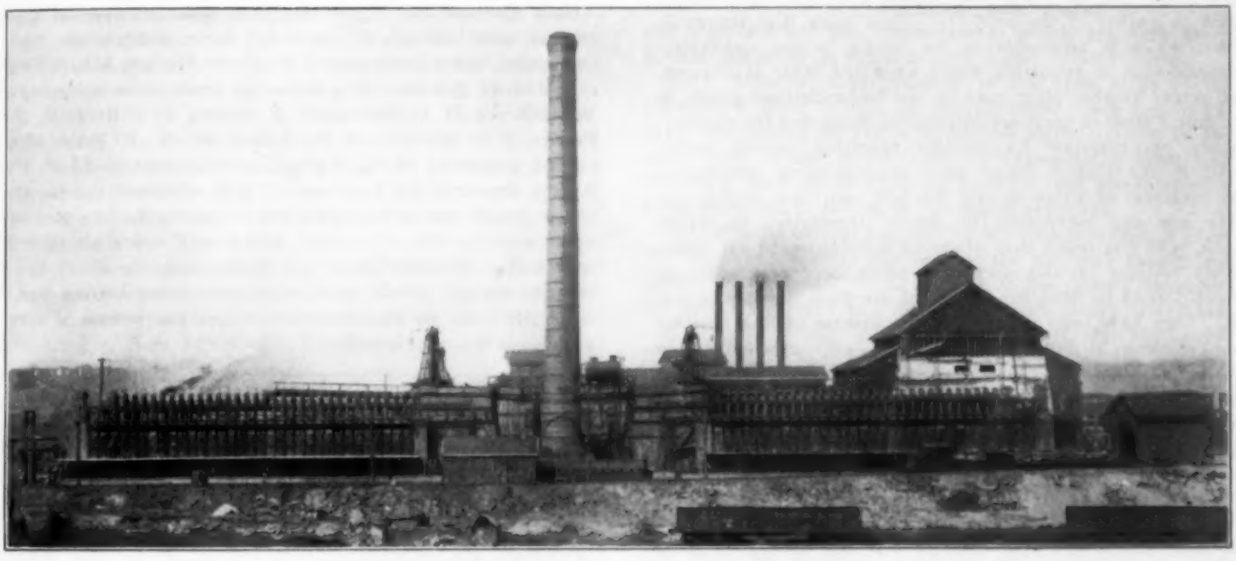


FIG. 10.—GENERAL VIEW OF RETORT COKE OVEN PLANT.

President Pitkin, of the American Locomotive Co., who recently inspected the Canadian plant, states that the results so far obtained at that plant are entirely satisfactory. The company has built a number of large type locomotives at the Canadian plant for both the Canadian Pacific and the Grand Trunk, and they have been accepted. The company is enlarging different parts of its Montreal works and expects to turn out 150 locomotives a year.

The statement of the Sloss-Sheffield Steel & Iron Co. for the quarter ending Nov. 30 shows net profits of $214,707, a decrease of $115,097 as compared with the same quarter of 1903. The surplus is $40,707, as compared with $111,615 in 1903.

THE IRON AND STEEL INSTITUTE VISIT.

The London *Ironmonger* presents the impressions of a staff correspondent who as a member of the Iron and Steel Institute made the American trip and gives his views in elaborated diary form. His pen is neither a quill nor a stub, and he has a sense of humor and a certain pungency that sometimes amounts to tartness. There is much of appreciation, but the vein of satire persists. The writer had his eyes open for the incidents and side-scenes of the trip and has woven these into a most readable series of chapters on the letters-of-travel order. He would have it known that the excursion was not the holiday jaunt many supposed and says that "quite two-thirds of the men in our party have spent their days in investigating matters pertaining to their trade, and making notes on their experiences for use upon their return."

The following summation of the views of the visitors as interchanged on the return trip is interesting: "On the way back the members compare notes; their impressions are remarkably uniform. They have found our hosts hospitable and courteous to a degree. They admire the size and the output of the American works, but they do not consider them equal to ours in the attention given to details, nor do they think that we need fear comparison either as regards finish or quality of the products. They think that automatic plant, which is admirable in the States, is not necessarily advantageous in countries where unskilled labor is cheaper, and where smaller plant, turning out better-finished goods, is the rule. Most of them are disposed to think that the extraordinary opportunities for rapidly acquiring wealth which exist in the United States have corresponding drawbacks, the foremost of which is that the best men have neither the time nor the inclination to devote themselves to public work, with the result that whatever individuals do for themselves is done lavishly and well, while most of the things which should be done for the public are done badly or not at all. They have been struck with the absence of that hustling and working at high pressure which are supposed to be distinctly American characteristics, or, rather, they think that the average Englishman works as hard and shows as good a result as the average American, but they admit that the American business man is much more accessible, and much readier to talk business, than his British brother. While agreed that the United States is a great country, they are content to live in England, and they have seen no signs on their visit which lead them to fear that Britain is going to be wiped out industrially just yet awhile. Finally, they all look forward with pleasure to their next visit."

British and American Use of Basic Steel.

London *Engineering*, reviewing the statistics of the American iron trade in 1903, directs attention to the attitude of consumers of steel in this country toward basic steel in contrast with the hesitancy of engineers in Great Britain. It says: "We have before had occasion to call attention to the fact that basic steel is viewed in the United States with much more favor than is the case in this country, and have expressed the opinion that our engineers might do well to show more confidence than they appear to do in this material, perfectly reliable as it has proved to be when manufactured with care and under proper supervision. Old customs and usages die hard in this country, however, and basic steel is still looked upon with suspicion in many quarters. That this view is not taken by our American cousins is shown clearly by the fact that in 1902 there were made in the States 4,496,533 tons of open-hearth steel by the basic process and 1,191,196 tons by the acid process, while in 1903 the production by the basic process amounted to 4,734,913 tons, and by the acid process to 1,094,998 tons. There was a decrease of a little over 8 per cent. in the production of acid open-hearth steel ingots and castings in 1903 as compared with 1902, but an increase in the production of basic steel of 5.3 per cent. These figures speak for themselves."

The Raapke Process for Steel Castings.

The Fischer Foundry & Machine Co. of Pittsburg has contracted with the Badische Maschine Fabrik Durlach, Baden, Germany, for a complete outfit for making specially high grade steel castings, and other steel products by the Raapke process, for which Fred F. Fischer of the above company has secured exclusive American patent rights. It is not yet definitely decided whether this plant will be installed at the company's foundry and machine works at Pittsburg, or at the Ford City Works, but the installation will be in charge of the inventor, Mr. Raapke. The Pittsburg company expects to be in the market with steel castings early in the new year. The Raapke process is now in successful operation at several plants in Germany and France and the quality and cost of product has been found very satisfactory. Mr. Fischer expects to introduce this process for making general steel products.

At a meeting of the board of directors of the Meriam-Abbott Co. and the Bruce Co., both manufacturers of gas engines, at Cleveland, it was voted to consolidate the two companies, under the name of the Bruce-Meriam-Abbott Co., capital stock, $100,000. The following directors were elected: W. C. Bruce, H. G. Schowe, F. E. Abbott, F. P. Root, N. P. Bowler, J. B. Meriam and Peter Gerlach. W. C. Bruce was elected president; H. G. Schowe, vice president, and F. E. Abbott, secretary and treasurer. The consolidated company's offices are at 8-10-12 Columbus street and the factory at Fall and Center streets, Cleveland, and it will manufacture the well known Meriam-Abbott gas engine, also the Bruce-Collins gas engines, as well as doing a general engineering business. Its order books are well filled and the outlook is very promising for 1905 business.

The new factory building of the Hope Webbing Co. at Pawtucket, R. I., measuring about 85 by 325 ft., presents an interesting application of the fan system of heating and ventilation. In connection with an old building, and contemplated additions, the total cubic contents amount to about 875,000 cu. ft. In this installation, made by the B. F. Sturtevant Co. of Boston, the distributing ducts occupy no valuable space, for the heated air is forced through an underground system into vertical flues which are built into the brick walls. From these flues the air is admitted in the usual manner through openings placed about 8 ft. above the floor level. With this arrangement it is possible to concentrate all of the heating surface in a single fireproof casing in connection with the fan, and to eliminate from the entire building all extended systems of steam piping. The plenum system, under which the air is forced into the building, insures a continuous supply.

The American Shipbuilding Co. has closed a contract with the Kelly Island Lime & Transport Co. for a tug and two steel scows, to cost $150,000. The scows will be 180 ft. over all and will carry 1,500 tons. They will be fitted with steam appliances throughout. The tug, which will be of steel, will be 80 ft. keel, 21 ft. beam and 12 ft. deep.

From the committee on judiciary in the House of Representatives, Dec. 13, Mr. Jenkins (Wis.), its chairman, reported back the resolutions introduced by Mr. Baker of New York, demanding an inquiry into the rail pool, with the recommendation that the resolutions lie on the table. The recommendation of the committee was adopted.

OBITUARY.

John Bertram, president of the Bertram Engine Works Co., Toronto, Ont., died Nov. 28, aged 67 years. He was born in Scotland and went to Canada in 1860.

John B. Anthony, for many years president of the Providence Tool Works and later treasurer of the Household Sewing Machine Co., Providence, R. I., died Dec. 7. He was born in Fall River, Mass., and was 75 years of age.

Leander M. De La Mater, formerly treasurer of the John Stephenson Car Works, Elizabeth, N. J., died Dec. 12, aged 70 years. Heart disease was the cause of his death.

Charles H. Lawton, one of the leading manufacturers of Northern Indiana, died at Wabash, Ind., Dec. 12, of tuberculosis. He was head of the Lawton Foundry & Machine Works, and was 62 years of age.

George Brooks, for 30 years superintendent of the foundry at the L. & N. railroad shop in Louisville, Ky., died Dec. 10 at his home in Columbus, Ind., aged 65.

E. J. Bird, Sr., died at his home in Ironton, O., Dec. 11, after a long illness. He was born at Staffordshire, Eng., April 30, 1828, and at an early age was employed in rolling mills and general furnace work. In 1858 he was engaged by the English government to go to the East Indies to instruct the natives in the manufacture of iron. He remained there nearly three years, receiving from the British government $500 in gold and a medal as a reward for having made the first casting ever produced in that part of the world. A few years later he went to Portugal, where, in the village of Marinha Grande he erected the first charcoal blast furnace ever built there. Returning to England, he became manager of the Galisdale Iron Works in Yorkshire and while thus engaged was very successful in converting titaniferous ore into pig iron. He came to America in 1868 and was employed in Maryland and in Chicago and Milwaukee. In 1877 he moved to Ironton and took charge of the Big Etna furnace. In later years he was identified with the iron business at Zanesville, New Straitsville, Big Stone Gap and again at Ironton.

The death is announced of Frederick Gottfried, for many years vice president of Patterson, Gottfried & Hunter, Ltd., New York, dealers in machinery and supplies. Mr. Gottfried was one of the founders of the business. He died at his home in Upper Montclair, N. J. on Wednesday, Dec. 7.

John Lyall Stewart, aged 57 years, one of the foremost contractors and engineers in this country, died at his home in Pittsburg on Monday, Dec. 19. With his two brothers he operated the contracting firm of James Stewart & Co., with offices in Pittsburg, New York, Baltimore and St. Louis, and was Pittsburg manager for this concern. The company of which he was a partner built many of the large industrial plants in the Pittsburg district and also did much work in England. Deceased was born in Kingston, Can., Jan. 17, 1847. He is survived by his widow, one son and three daughters.

Frank M. Losey, of Louisville, Ky., died on Dec. 2. Mr. Losey was born in Detroit, Mich., in 1861, and for a number of years was connected with the master mechanic's department of several railroads. For some time he was in Old Mexico with the Mexican National Railway. He returned from Old Mexico and accepted a position with the Ainslie Cochran Co., which position he resigned to help found the National Foundry & Machine Co., of which he was secretary and treasurer to the time of his death.

Martin Kingman, president of the Kingman Implement Co., Peoria, Ill., manufacturers of agricultural machinery, died Dec 19, from the breaking down of his system.

The Builders' Iron Foundry, Providence, R. I., has completed an order for small boring mills for the Japanese government, the machines being intended for one of the Japanese arsenals. It is thought that several Bridgeport concerns have secured orders for war materials, but the companies will not make a statement in regard to the matter.

PERSONAL.

Joseph N. Dalsen, who was connected for many years with the A. & P. Roberts Co., and more recently with the Carnegie Steel Co. as assistant to its Philadelphia manager, has resigned the latter position and is now connected with Morris, Wheeler & Co., of Philadelphia, dealers in wrought iron and steel.

H. P. Parrock, superintendent of the steel mill of the Hamilton Steel & Iron Co., Ltd., Hamilton, Ont., has tendered his resignation, to take effect Jan. 1.

D. B. Hinckley, who became president of the Fulton Iron Works, San Francisco, on the death of James Spiers, is about to retire on account of poor health and will be succeeded by W. C. Ralston, a well known mining expert on the Coast.

Another recent addition to the Allis-Chalmers staff is O. A. Stranahan, whose experience has been with the Westinghouse companies. Mr. Stranahan has been appointed manager of the power department of the Allis-Chalmers Co., and will have charge of the sales of reciprocating engines, gas engines, and steam turbines. He has been for three or four years in charge of the engine business of the British Westinghouse Electric & Mfg. Co. He has given much attention to gas engine developments, particularly with regard to producer and blast furnace gas, developments which are very much farther advanced in Europe than in the United States.

H. J. Schotter, superintendent of the plate mills of the Homestead Steel Works of the Carnegie Steel Co., Pittsburg, who retires on Jan. 1 to become superintendent of the upper and lower union mills, Lindsay-McCutcheon and Monessen plants of the Carnegie Steel Co., was presented with a handsome silver service by his fellow employes.

The office of general manager of the Republic Iron & Steel Co. has been abolished and with it the operative department located at Chicago. W. L. Simonton, the general manager, has been transferred to a district superintendency in Indiana.

E. E. McConnell, Pittsburg manager of the McConnell Wheel & Mine Supply Co., of Uniontown, Pa., has resigned and has been succeeded by M. P. Dill.

B. J. Ross, manager of the tinning department of the Shenango tin plate plant of the American Sheet & Tin Plate Co., New Castle, Pa., has resigned. L. Jones succeeds Mr. Ross.

Berthold Goldsmith has resigned as district manager of the American Sheet & Tin Plate Co., having charge of mills in the Wheeling district, and has purchased the Beaver tin plate mill from the company, which he will operate as a sheet copper mill.

A. M. Fowler, formerly identified with the Union Iron Works Co., as superintendent, at Springfield, Mo., has resigned that position to become vice president and general manager of the New Phoenix Foundry & Machine Co., which is a new industry located at Springfield, Mo. The president of the new company will be Geo. H. McCann, and the secretary and treasurer, John Schmook.

The property of the Port Huron Steel & Screw Works, Port Huron Mich., has been sold to E. W. Wilson, of the Port Huron Saw Works, for $9,000, subject to a $4,000 lien on the building. Liabilities of the Steel & Screw Works amount to $200,000 and the appraised value of the works was $24,000. If the sale is confirmed the new owner will enlarge the plant.

The plant at Anniston, Ala., of the Illinois Car & Equipment Co., formerly operated by the Southern Car & Foundry Co., has been sold to the Western Steel Car & Foundry Co., of Chicago. The malleable and soft iron foundries will be rebuilt and some changes will be made to other buildings. H. A. McCord, formerly president of the Illinois Car Co., will be general manager of the plant at Anniston.

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DECEMBER 22, 1904

INTERNATIONAL STEEL AGREEMENTS.

Announcement has already been made, and on the best authority, of the conclusion of an agreement between British, German, French and Belgian steel manufacturers. Within the last week cablegrams have stated that American producers have been arranged with as to certain territory, the statement being to the effect that the foreign manufacturers are to abstain from competition in Mexico and South America in return for an agreement by American manufacturers that the foreign pool's prices will be maintained in certain other neutral markets. It is known that negotiations have been on between the United States Steel Corporation and the German Steel Verband, both as to rails and other products, but the result of these has not been authoritatively given out as yet. That some agreement between the British and Continental rail makers was needed in order that the former might do business at a profit appears from the decline of rail prices at British mills in the past year. On the west coast of England standard section rails have recently sold at $19 a ton, as against $24 one year ago. In the Middlesborough district the decline has been $3 a ton in the same period, or from $25 to $22.

Some time ago the statement was made that the United States Steel Corporation had declined to enter into any agreement with the German steel manufacturers, but in view of the maintenance of the $28 rail price in the United States, it seems not unlikely that an arrangement would be entered into by which foreign rail manufacturers would refrain from competing on the Pacific Coast and in the extreme South, for particularly on the Pacific Coast imported rails at such prices as the foreign association could quote would be a menace to the domestic price recently agreed upon.

The significant feature of these international negotiations among steel manufacturers is the growing disinclination of those in the industry to engage in cutthroat competition. With every year the value of ore reserves, in whatever part of the world, is being better appreciated. Owners of iron mines are refusing to part with their ore except at a good profit, realizing that wealth taken out of the ground cannot be replaced or renewed, and that every year is reducing by an enormous amount the ore supply of the world. A past president of the Iron and Steel Institute, in responding to a toast at one of the functions in connection with the recent visit of the Institute to his country, probably voiced the sentiment of steel manufacturers on both sides of the water when he said that the problem of the future would not be so much one of getting business from a competitor as of furnishing steel enough to meet the world's demands. Times of depression will come, alternating with prosperity, in the old-fashioned way, but students of the iron trade cannot get far away from a strong faith in the abiding value of the materials with which they deal. Appreciation of ore and fuel values is the one constant factor in the problem that will only be slightly affected by the ups and downs of financial and industrial conditions.

The tendency to make international agreements is also important to the steel trade of the world in view of the tariff agitation on both sides of the water. German and American protective duties, Canadian anti-dumping legislation and some form of protection for British steel manufacturers, all appear in a new light when the possibilities of international agreements between powerful iron and steel syndicates are considered.

THE BRITISH IRON TRADE.

The tenor of recent reports of the state of the British iron trade indicates a plucking up of courage after a year of exceptional dullness. Reports from other British industries from time to time throughout the year have indicated that all were suffering from a falling off in demand and the number of unemployed has been greater than in several years. Figures for iron and steel exports from Great Britain in the first eleven months of 1904 show that the tonnage fell off from 3,321,263 from Jan. 1 to Nov. 30, 1903, to 2,974, 579 to Nov. 30 this year. The decrease was thus 346,648 tons, or about 11 percent. The principal falling off was in pig iron exports, 258,631 tons, and in rails and track material, 84,742 tons.

The British iron trade journals note that recently there has been a turn for the better, though the change is by no means pronounced. The shipbuilding trade gives a better promise than at any time in the year and the demand from mining and railway sources has increased recently. Better export business is looked for from the development of the Australian railway system, which has been noteworthy, and there is good promise from the marked industrial awakening in South Africa. Railway extension in India is also looked to to contribute its share to British mills.

Some advance in prices has taken place in British markets in the last few weeks, Middlesborough pig

iron having gone up from 75c to $1 since early in November. This has been due in part to active speculation in pig iron warrants, the advance in which at the extreme high price, $11.85, was about $1.75 above the minimum for the year.

The growing opinion that international complications are not to result from the Eastern war is no doubt responsible in part for the better feeling in the British iron trade, and the damming up of demand in the months of slow trade ought to be succeeded in the natural order by something of a freshet in the near future.

Pig iron production in the United States promises to come close to 16,450,000 tons in 1904. The official figure for the first six months of the year was 8,173,438 tons, the spurt of improvement that began in April and lasted for three months, compensating for the shrunken output at the opening of the year. Considering the amount of improvement literature that has been produced in the second half of 1904 relative to the iron trade it might seem surprising that the pig iron production in 1904 after July 1 should be so close to that in the first half. It is to be considered that from Jan. 1 to July 1 there was an increase of furnace stocks while in the second half of the year merchant pig iron stocks have declined about 300,000 tons. It is particularly noteworthy that this year which opened so inauspiciously and that from the beginning has been rated an unfavorable year in the iron trade, should have yielded an output of pig iron only about 1,500,000 tons or but 8 percent below the best year's record in our history.

Activity in Rolling Mill Machinery.

(Special Telegram.)

PITTSBURG, Dec. 21.—The Mesta Machine Co. has been awarded a contract for the erection of a 27-in. rail mill, three high, together with engines for driving the same, by the Illinois Steel Co. The blooming mill for this plant was recently installed by the United Engineering & Foundry Co. A contract for six 22-in. sheet mills for the National Enameling & Stamping Co., Granite City, Ill., has also been awarded the Mesta Machine Co. The United Engineering & Foundry Co. received a contract for a 10-in. mill for the Sharon Steel Hoop Co., Sharon, Pa. Rolling mill machinery builders now have more work than at any time in two years. Mackintosh Hemphill & Co. have the Eastern Steel Co. structural mill engines and other equipment, also the engine for the La Belle plate mill. The United Engineering & Foundry Co. has the rail and sheet bar mills for the Republic Iron & Steel Co. and the plate mill for the La Belle Iron Works. Smaller orders are numerous and there is a distinct revival in this line of work with all builders in this territory.

Alabama Consolidated Stock Purchased.

The International Trust Co., of Baltimore, has sold to New York men 6,000 shares of common stock of the Alabama Consolidated Coal & Iron Co., for about $225,000. It is understood that with the purchase of this block of common the New York purchasers have secured control of the Alabama company. The names of the purchasers are not divulged, but it is understood that they are closely identified with the largest iron interests of the South, who will be able to bring the company strong support. A meeting of directors will be held in New York this week and it is expected that several directors will resign.

LAKE SUPERIOR IRON MINES.

Shipments for the year by various large interests have been estimated as follows: United States Steel Corporation, 11,200,000 tons; Corrigan, McKinney & Co., 2,500,000; Pickands, Mather & Co., 1,050,000; Republic Iron & Steel Co., 350,000. Shipments from the Menominee range are estimated to have aggregated 3,250,000 tons. The production of the range last year was 3,749,000 tons. The Adams mine at Eveleth, Mesabi range, closed the season with a record of 935,500 tons, as compared with 1,110,000 last year; the Spruce, 585,050 tons, against 587,150 in 1903, and the Fayal, 975,400 tons, compared with 1,040,000 during the preceding season. The Burt mine at Hibbing shipped 450,000 tons and the Biwabik 545,000. The Leonard mine at Hibbing, where stripping operations were started in 1903 is counted on for 500,000 tons next season. This year 150,000 tons were sent out. Corrigan, McKinney & Co.'s big Stevenson mine on the western Mesabi was the leading shipper of the season, it having sent out 1,650,000 tons. Next year when the Great Western, Dunn and Commodore mines will be added to the active list, this firm will materially increase its production.

The U. S. Steel Corporation's shipments for the year from all its Lake Superior mines have been 11,174,110 tons. This is in comparison with 15,303,355 tons in 1903 and 16,063,179 tons in 1902. Last year the company carried forward a lot of ore on lower lake docks but expects this winter to clean up pretty well what is on hand there, except for some grades and off lots. This will make its 1905 shipments materially larger than enough to carry it through that year, providing its policy of maintaining a supply of ore ahead, guarding against contingencies, is adhered to. This policy is to be followed, unless exceptional circumstances make it advisable temporarily to change it. It is possible that such a time will come with the new year and that in consequence the Corporation's shipments may not be adjusted to more than its probable requirements to the opening of navigation in 1906, and a reasonable quantity to provide against a late opening. Of course this policy of providing a surplus stock of ore would be most logically carried out in years when the cost of mining and forwarding is least. It looks now as though freights on ore would be higher the coming season, and the cost of mining will probably be somewhat advanced, so that ore will cost more, delivered at Lake Erie, than it did this year. This may militate against a large surplus forwarding. The Steel Corporation took time by the forelock this year and secured double allotment from Stevenson, the entire amount from that mine for the Corporation having been about 500,000 tons. It also has 25 percent of Mahoning, a like interest in Biwabik, half of Pewabic, and interests in other mines, some of which have been active this year. These all increase its tonnage to about 12,000,000 gross tons for the year.

Chicago & Northwestern's ore business for the year, from all its Lake Superior lines, to Escanaba, Ashland and all rail, has been little over 4,000,000 tons. This road has been the heaviest handler of ore around the lake, but has lost that distinction now, and the Duluth, Missabe & Northern has taken it, probably not to be replaced by any other road for a good many years. There is no doubt that the Duluth line will lead all the other Minnesota roads by a good margin for years to come.

The crucible steel plant of the Burns Uniform Steel & Metal Co., Latrobe, Pa., will be placed in operation shortly after the first of the year. The plant contains one 48-pot furnace and three hammers.

The Labor Situation.

AMERICAN CIVIC FEDERATION.

At a meeting of the executive committee of the American Civic Federation held in New York, Dec. 15, August Belmont was elected president to succeed Marcus A. Hanna. He was chosen by a special committee consisting of John Mitchell, Archbishop Ireland and Franklin MacVeagh. The other officers chosen were: First vice president, Samuel Gompers; second vice president, Oscar S. Straus; chairman of the way and means committee, Henry Phipps; treasurer, Charles A. Moore, chairman welfare department, H. H. Freeland; chairman trade agreement committee,— Francis L. Robbins; chairman executive council, Ralph M. Easley; secretary, Samuel B. Donnelly.

These selections were ratified at a dinner of the Federation held in the evening, at which a letter was read from Mr. Carnegie. After referring to the absence of strikes among farmers and those engaged in domestic service, which he attributed to the closer personal relations of employers and employes, Mr. Carnegie said:

"As far as the largest manufactories and mines are concerned, I think the great corporation engaged in a dispute with its men makes a mistake if it adopts the policy, or even considers it, of running the works with new men.

"First, the best workmen are not idle, and to employ the only class that can be obtained is to lay the foundation of serious future trouble. It does not pay to lose a body of excellent workmen and sober, respectable men, nor to employ the class of workmen whose services can be obtained to fill their places.

"There is another consideration of much weight. Just in proportion that the workman is earnest and efficient is his pride in his work. To compel him to stand by and see an outsider, almost sure to be his inferior both as workman and as man, take his place, is to subject him to a trial he should be spared. That the support of his wife and children depends upon his labor, of which he is deprived by another, is the most excruciating thought of all. This is a trial to which no workman should be subjected.

"Even when the employer succeeds in running the work with new men, his victory is really a defeat. He will ultimately lose more by the change than he would have lost had he patiently awaited a settlement with his old men.

"If, in case of a strike, the employer promptly informed his men that they need have no apprehension about their jobs; that he would not have any but his own men and knew that he could not get such men as they and therefore, would wait for them until their unfortunate differences were settled, all would soon be well. I think employers should make this invariable rule—never to employ new men in case of a strike, but to wait patiently for the old men.

"In special branches this policy is impossible, such as in street and other railways, and wherever the daily wants of the public are concerned. No doubt new men in extreme cases must be employed, but it is a sad necessity, to be avoided whenever possible. In these cases public sentiment plays a potent part and hastens a settlement."

In conclusion Mr. Carnegie wrote: "It is wholesome that capital should be made to pay well for labor, and to pay very high for it when profits are high, and it is inevitable that wages will fall when profits fall, so that we must not expect, neither be alarmed at, repeated demands and repeated rejections from both employers and employes from time to time. These are healthy signs.

"What the Civic Federation should aim at is that strikes or lockouts should be prevented, and for these I can see no cure so effective as a trade agreement providing for arbitration, after every effort has been exhausted to settle the differences by the employer and his men."

Mr. Carnegie's address was read by Secretary Easley, illness preventing the attendance of the ironmaster.

METAL TRADES ASSOCIATION NOTES.

Cincinnati, O., Dec. 19. J. W. Lee, manager of the employment department of the St. Louis Metal Trades Association states that judging from the fact that for every man laid off about two are employed, business is improving in the St. Louis machine shops. This gradual increase in shop forces has been noticeable for several weeks.

The annual meeting of the New York Metal Trades Association will be held Thursday, Jan. 12, for the election of officers and reports of committees. The executive committee of this association met on Dec. 13 and appointed M. K. Bowman, W. H. Harrison and H. C. Hunter a nominating committee for the coming election.

It is reported that the International Association of Machinists is having considerable difficulty in the collection of the special assessment of $1 which was levied by the grand lodge.

Herman S. Hastings, of the Worcester Metal Trades Association, states that there is a decided increase in demand for help from members of the association.

H. G. Freck, assistant Secretary of the Cincinnati Metal Trades Association, claims there is an organized movement in the shop of one of its members to determine whether or not the employe was secured through the association's labor bureau, with the purpose apparently of making life unpleasant for an employe so engaged. At a general meeting of the association on Dec. 10 rules were adopted which if carried out will keep the shops of this association filled with skilled and desirable mechanics.

The Philadelphia Manufacturers' Association will hold its annual meeting on January 24. At this meeting there will be an election of officers and councilors. According to the report of the labor bureau there were 35 more operatives employed for the past month than were laid off.

Commissioner W. P. Eagan of the National Metal Trades Association who has been in New York for the past two weeks, will now make his headquarters in Boston for some time.

From present indications it would appear that the list of applicants for membership in the N. M. T. A. now being made up will exceed the record. This is taken to indicate that the amendment to the constitution and by-laws reducing the initiation fee was a good move.

LABOR NOTES.

President Maben, of the Sloss-Sheffield Steel & Iron Co., says that even though iron should go to $50 a ton, his company would not yield to the demand of the union miners of Alabama now on strike. He says his company is operating all seven of its furnaces and constantly increasing the supply of labor and will continue to conduct its mines on the open shop basis.

After being idle about a year on account of labor troubles the American Steel Foundries has resumed operations at the East St. Louis, Ill., plant. Many skilled workmen were taken from the company's plant at Granite City. About 2,000 men are now employed and later 1,000 additional will be put on as a night force.

The Worcester Pressed Steel Co., formerly the Worcester Ferrule & Mfg. Co., has just become a member of the Worcester Metal Trades Association.

The proposals made by the Townsend-Downey Shipping Co. to open a co-operative yard are said to have been approved by union labor leaders, and the president, Wallace Downsey, president of the New York Metal Trades Association, states that the new enterprise will soon be launched on an "open shop" basis. Under the general plan the workmen will receive the prevailing rate of wages, and at the end of the year share in

the surplus, the dividends being based upon the amount of their wages for the year. Allowance will be made for repairs, for deterioration of the plant, for interest on the amount of capital invested, and for losses.

W. A. Minely and Charles Dietrich, officers of the Machinists' Union of Pittsburg, were found guilty of conspiracy in the criminal court. They were charged by W. H. Monahan with entering into a conspiracy to cause him to lose his position because he would not join the Machinists' Union.

Steps have been taken to adjust the differences between the Champion Iron Co., Kenton, O., and its molders. The molders will work for ten days at reduced wages. If at the end of that time the output does not justify the company in restoring the former wages, the controversy will be submitted to an arbitration board.

At a special meeting of the board of trustees of the Amalgamated Association of Iron, Steel and Tin Workers, held this week, it was decided to extend the time of paying strike benefits. The association now has four strikes on its hands—one at Lebanon, Pa., another at Indiana Harbor, Ind., and two at the mills of the American Steel Hoop Co. at Girard and Youngstown, O.

The grand jury which has been investigating the attempt to dynamite the Eureka foundry, Cincinnati, has completed its labors. Six indictments were found. While no names are given out, excepting Rauhausen Jr., and Hallowell, it is understood that the evidence was not considered sufficient to indict Jos. Valentine, president of the Iron Molders' Union. Another feature of the report of the jury was the returning of an indictment against Wm. Patton and Thomas M. Bracken for murder in the first degree for killing Samuel Weakley. The murdered man was a non-union molder who was followed by Patton and Bracken on the street, and, after some words and an assault on Weakley, he was shot by Patton.

Engine Builders' Association.

The Engine Builders' Association of the United States held its annual meeting at New York Dec. 9 and 10. President C. A. Gates delivered the address of welcome. At the opening session the following papers were read: "Costs," by C. M. Lauer, Philadelphia; "The Steam Turbine," by F. C. Bates, New York; "Employers' Associations," by Charles L. Eidlitz, New York; "Salesmanship as an Applied Science," by R. U. Conger, New York. The committee on sales and contracts reported a standard form of contract which was adopted by the association, giving better protection to builders of engines. A table of standard sizes for bolt holes for the attaching of the engine to the armature of the generator when direct connected was adopted. The election of officers for the ensuing year resulted as follows: C. A. Gates, Russell Engine Co., Massillon, O., president; Thomas C. Wood, Ball & Wood Co., Elizabeth, N. J., vice president; Arthur L. Merriam, Ames Iron Works, Oswego, N. Y., treasurer; Nathan B. Payne, the Payne Co., Elmira, N. Y., secretary. C. S. Bonsall of the Buckeye Engine Co., Salem, O., and H. C. Nichols of Nichols & Langworthy, Hope Valley, R. I., were elected to the council. The other members of the council are: J. I. Lyle of the Buffalo Forge Co., Buffalo, N. Y.,; Nathan B. Payne, the Payne Co., Elmira, N. Y.; S. F. Begg, Watertown Engine Co., Watertown, N. Y., and Walter C. Kerr, of the Westinghouse Machine Co., Pittsburg, Pa.

A Victory for Steel Importers.

The court of claims, Washington, D. C., has rendered a decision against the United States involving the refund of duties amounting to about $1,000,000 paid for the importation of steel in the form of blooms from 1879 to 1882. The decision was in the case of the Cambria Iron Co., brought to test the validity of the ruling of the Secretary of the Treasury that under the law of 1867 steel blooms were partially manufactured rails and should be assessed at the rate of 45 per cent, ad valorem, instead of 30 per cent, under the classification of "other forms of steel not enumerated." The case may be appealed to the supreme court.

The list of claimants is as follows: J. F. Bailey & Co., H. E. Collins & Co., Edgar Thomson Steel Works, Ltd., Carnegie Bros. & Co., Ltd., James Lee & Co., Downing, Sheldon & Co., R. F. Downing & Co., Albany & Rensselaer Iron & Steel Co., Joliet Steel Co., Cleveland Rolling Mill Co., O. L. Garrison, for Vulcan Steel Co., and St. Louis Ore & Steel Co.; St. Albans Iron & Steel Co.; Godeffrey & Co., for the Albany & Rensselaer Iron & Steel Co.; Oliver L. Garrison, A. E. Godeffrey & Co., James Johnston, Clarke, Post & Martin and Post, Martin & Co., agents for Springfield Iron Co.; Charles W. Matthews, Harry C. Arbuckle and Brown Bros. & Co., agents for Charles W. Matthews; E. Samuel & Co., Henry W. Oliver, Jr., A. H. Childs, agent for Henry W. Oliver, Jr.; Lewis, Oliver & Phillips, Schrader & Ellery, Peter Wright & Sons, agents for Cambria Iron Co.; Diamond State Iron Co. Interstate Improvement & Construction Co., Baltimore & Ohio Railroad Co., agents for Interstate Improvement & Construction Co.; Charles H. and Eugene Odell, agents for Sandusky Rolling Mill & Mfg. Co., and Northern Pacific Railroad Co.; Northern Pacific Railroad Co., Drexel, Morgan & Co., A. H. Barney and Robert Garrett & Son, agents for Northern Pacific Railroad Co.; E. S. Wheeler & Co., and Edgemoor Iron Co.

American Skein & Foundry Co.

An application has been made for a charter for the Southern Skein & Foundry Co., which has been organized at Chattanooga, Tenn., with a capital of $100,000. Incorporators are: James K. Jones, John G. Johnson, G. N. Prentiss, Harry L. Probasco and Frank A. Nelson. The stock will be held by the incorporators and friends in the East. The business of the company will be the manufacture of cast iron and steel wagon skeins. A site consisting of 16 acres at Chattanooga has been purchased and buildings will be begun as soon as plans can be made. The company will have the following competitors: Illinois Iron & Bolt Co., Studebaker Bros. Mfg. Co., American Skein & Foundry Co. It estimates that there is a business in the South of 50 tons per day. The officers of the company will be: J. G. Johnson, president; James K. Jones, vice president; Harry L. Probasco, treasurer, and G. N. Prentiss, secretary. Senator Jones is the well known Arkansas Democrat. Mr. Johnson was formerly at Peabody, Kan. Mr. Prentiss was secretary and general manager of the Racine Steel & Iron Co. for years. Mr. Probasco is president of the Bank of Chattanooga, and Mr. Nelson is cashier of the same bank. For further particulars address G. N. Prentiss, Racine, Wis., until Jan. 1, and after that date, Read House, Chattanooga, Tenn.

The Inland Steel Co., Chicago, is putting its sheet mill at Indiana Harbor, Ind., in shape, with a view to starting same up early in January. This mill has been closed down since last July, owing to the refusal of the company to pay the scale demanded by the Amalgamated Association. From this date, however, the mill will be strictly non-union, operated under open shop rules, each man making his own agreement with the company.

During the holiday shutdown a new blooming mill will be installed at the Shenango works of the Carnegie Steel Co., located at New Castle, Pa. The old mill is only capable of rolling two-ton ingots, while the new mill will be able to break down ingots weighing three tons. The capacity of the rolling department will be increased 50 percent by the installation of the new mill.

After being out of blast for a year, No. 5 furnace of the Bethlehem Steel Co., South Bethlehem, Pa., was put in operation December 14.

NEW ENGLAND FOUNDRYMEN'S ASSOCIATION.

The regular monthly meeting of the New England Foundrymen's Association was held at the Exchange Club, Boston, Wednesday, Dec. 14, the president, B. M. Shaw, in the chair. Applications for membership were received from the following and they were elected: Massachusetts Steel Casting Co., Everett, Mass.; Russell & Erwin Mfg. Co., New Britain, Conn.; P. & F. Corbin, New Britain, Conn.; B. F. Perkins & Son, Holyoke, Mass.

Announcement was made that the January meeting, which is to be the annual meeting, would be a little out of the usual. The executive committee expects to have present some men of national repute who will speak on general subjects.

The nomination of officers was taken up and President Shaw declining to serve again, the following were nominated to be balloted upon at the annual meeting:

President—John Magee, Magee Furnace Co.

Vice president—W. B. Snow, B. F. Sturtevant Co.

Treasurer—Geo. H. Lincoln, Geo. H. Lincoln & Co.

Secretary—Fred F. Stockwell, Barbour-Stockwell Co.

For an executive committee of five the following were nominated: J. O. Henshaw, N. S. Bartlett & Co.; A. J. Miller, Whitehead Bros. Co.; Harry E. Gibby, Mechanic Foundry Co.; A. N. Abbe, P. & F. Corbin; W. C. Doherty, Doherty Bros.; H. A. Carpenter, A. Carpenter Sons Foundry Co.; J. F. Lanigan, Davis Foundry Co.; S. G. H. Fitch, Vaughn Machine Co.; A. W. Whitcomb, Kabley Foundry Co.

A telegram was read from Geo. H. Hull, of New York, who was to address the association on the "Finance of Iron," stating that owing to pressure of business it was impossible for him to be present to address the meeting. As the telegram came too late for the committee to make arrangements for another speaker, President Shaw called upon some of the members to express themselves regarding the pig iron storage warrant system. As it was thought it would be to the best interests of the members of the association to learn the real status of this system, it was voted that a committee of three be appointed to investigate the matter and report to the association within three months. The chair appointed Messrs. Carpenter, Henshaw and Stockwell.

The questions scheduled for discussion at the afternoon meeting were then brought up, and in the following the gist of some of the answers is given:

Question—What have you found to be the actual saving by the use of a cinder mill?

Ans.—At our plant we found that there was a good deal of loss from some source or other and we came to the conclusion we were losing about a ton a day upon the bottom. We purchased a large water mill and put it on the dump and commenced operations. We ran it all summer and besides the expense for water, etc., we made very little out of it. We could not run it during the winter time because it would freeze up. We plan now to put in a dry mill, believing it will pay us to use it and we can use it both winter and summer.

Ans.—We have a dry mill installed in our plant and we are deriving great benefit from it. We figure there is an increased saving of about 5 percent per day over the old method.

Question—What have you found to be the actual saving by the use of compressed air tools?

Ans.—We have roughly estimated that with air tools one man can do the work of three with hand tools. We do not know of anything in the chipping department especially that can take its place.

Ans.—In our shop we very often find it impossible to get the men to use these tools, especially the foundry lumpers. They complain a great deal when requested to use them because it has a tendency to make their arms useless, especially when they first commence to use them. In some cases this is overcome, as the men become more acquainted with the way of handling the tools and they are sometimes very willing then to use them, especially so in cases where they are on piece work. We have at times taken helpers from the machine shop and put them in the foundry and they seem to be able to handle the air tools with considerably more ease, which we think is due to their being accustomed to handling tools of a similar nature in the machine shop.

Question—What is the best fuel ratio which you have been able to obtain?

Ans.—We figure as a rule a ratio of from 8½ or 8¼ to 1 and do not attempt to cut it any finer.

Ans.—For cotton machinery we are melting about 36 tons per day and get a ratio of 9 to 1 and 10 to 1. We have in cases melted only 20 tons per day but we do not think it changes conditions any as to the amount of iron you melt.

While this last question was up it was stated that the Philadelphia and Pittsburg associations made an experiment a short time ago regarding this matter. It was voted that the secretary be instructed to communicate with these associations and ascertain what results they obtained. Owing to the lateness of the hour it was voted to omit the discussion of the rest of the questions. The following were in attendance:

John Magee, Magee Furnace Co.
C. T. Shaw, Philip M. Shaw & Co.
B. M. Shaw, Walker-Pratt Mfg. Co.
G. H. Stearns, Walter-Pratt Mfg. Co.
H. A. Carpenter, A. Carpenter & Sons Foundry Co.
F. F. Stockwell, Barbour-Stockwell Co.
A. N. Abbe, P. & F. Corbin.
A. J. Miller, Whitehead Bros. Co.
J. M. Taylor, National Founders' Association.
G. H. Lincoln, Geo. H. Lincoln & Co.
C. C. Boyden, Matthew Addy & Co.
R. C. Bird, Broadway Iron Foundry.
S. G. H. Fitch, Vaughn Machine Co.
C. A. Reed, N. S. Bartlett & Co.
T. W. Frye, Sullivan Machinery Co.
L. N. Perrault, B. F. Sturtevant Co.
W. B. Snow, B. F. Sturtevant Co.
J. M. Towle, Chicago Pneumatic Tool Co.
W. A. Garratt, Whiting Foundry Equipment Co.
A. F. Hammett, F. D. Moffat & Co.
J. L. Anthony, Weir Stove Co.
F. J. Stewart, Jas. Stewart & Co.
W. J. Breen, Agt., Hugh W. Adams.
E. A. Tutein, Crocker Bros.
W. M. Saunders, Saunders & Franklin, Chemists.
S. E. French, Athol Machine Co.
M. L. Gay, Rogers, Brown & Co.
J. Cunningham, B. F. Perkins & Son.
R. H. Penney, Barbour-Stockwell Co.
S. M. Thompson, Barbour-Stockwell Co.
T. C. Wilson, Barbour-Stockwell Co.
T. H. Colvin, Colvin Foundry Co.
L. S. Brown, Springfield Facing Co.
W. H. Stafford, Gibby Foundry Co.
W. H. Coffin, Springfield Facing Co.
Geo. H. Gibby, Gibby Foundry Co.
J. B. Jordan, Massachusetts Steel Casting Co.
J. W. Johnson, Penn Steel Casting Co.
E. H. Lyon, Brown & Sharpe Mfg. Co.
D. F. Eagan, Pridmore Co.
J. F. Perault, Fitchburg Foundry Co.
M. J. Perault, Fitchburg Foundry Co.
W. T. Nicholson, Cutter, Wood & Stevens Co.
W. F. Savage, Smith & Anthony Co.
W. C. Skulley, Smith & Anthony Co.
J. F. Kyes, Reed Foundry Co.
A. O. Smith, Smith & Wallace.
A. Herrick, Smith & Wallace.
G. A. Locke, Smith & Wallace.
G. H. Carson, Mechanics Foundry Co.
H. E. Gibby, Mechanics Foundry Co.
C. H. Gifford, B. F. Sturtevant Co.
W. H. Bense, Kinsley Iron & Machine Co.
O. E. Nutter, Saco & Pette Machine Shops.
L. W. Penney, Saco & Pette Machine Shops.

The schedule of assets and liabilities of the United States Pump & Supply Co., Toledo, O., against which a petition in bankruptcy was recently started, has been filed and shows that the assets are $44,301 and liabilities $109,555.

DEATH OF SIR LOWTHIAN BELL.

A London cablegram tells of the death on Dec. 20 of Sir Lowthian Bell, who was known as the greatest authority in Great Britain on blast furnace practice. A sketch of the distinguished metallurgist appeared in *The Iron Trade Review* of Oct. 27, 1904, in connection with some account of the work of the more prominent members of the Iron and Steel Institute. He was born in 1816 and with his brothers Thomas and John founded the famous firm of Bell Bros., known in Middlesborough as the Clarence Iron Works. It has been one of the foremost blast furnace plants in England. Sir Lowthian was one of the visitors to America at the time of the British Iron and Steel Institute trip in 1890, and upon his return he made an exhaustive report on the American iron trade. It was notable that more data concerning iron making in America up to that time was brought together in the one volume than had ever been compiled in a single work in this country.

SIR LOWTHIAN BELL.

Owing to the difficulties encountered in securing a force of men to operate the Donora, Pa., blast furnaces of the Carnegie Steel Co., it is impossible to light the stacks before Jan. 5. Orders have also been issued to operate the open-hearth plant which contains 12 open-hearth furnaces of 50 tons capacity each. J. E. Thropp Jr., formerly night superintendent of the Duquesne furnaces of the Carnegie Steel Co., has been placed in charge of the Donora stacks. The Mingo Junction, O., Bessemer plant of the Carnegie Steel Co. was started last week, and fires have been lighted under the company's two furnaces at Columbus, O. As soon as these are in operation the Bessemer plant will resume after more than half a year's idleness. When the Donora and Columbus steel works are in operation every steel plant operated by the Carnegie Steel Co. will be on, while shortly after the first of the year the only idle stacks will be at Zanesville, O., and at the Isabella plant, Pittsburg. The Edith furnace of the American Steel & Wire Co., located at Allegheny, Pa., which has been idle for four months, is preparing to blow in and will be in operation before the end of the week.

On January 1 the Lodge & Shipley Machine Tool Co., Cincinnati, will take possession of the two story building 60 x 240 ft. on Elm street, adjacent to its plant, now occupied by the Oesterlein Machine Tool Co. This plant will be equipped for the manufacture of the Lodge & Shipley 14 and 16-inch sizes of engine lathes.

The Crescent Forging Co., Pittsburg, has been organized with a capital of $50,000 for the purpose of operating a forging plant at Oakmont, near Pittsburg. Reuben Miller Jr., formerly connected with the Solid Steel Tool & Forge Co., will be president of the company, and D. W. Dunlevy, vice president and general manager. Contracts for machinery will be awarded shortly.

Wm. Tod & Co., Youngstown, O., have received an order from the Illinois Steel Co. for two large blooming mill engines.

THE CANADIAN IRON TRADE.

TORONTO, Can., Dec. 19.—In the past few weeks the improvement in the iron trade has been marked. The principal factors of the situation are the great amount of railway construction now going forward or in contemplation, the rapid settlement of the west and the anti-dumping clause which it is claimed has diverted to Canadian manufacturers many orders which would otherwise have gone to American firms. The mills are all busy, with quite good orders ahead, and there is to some extent a shortage of supplies. Prices show a marked upward tendency and pig iron and the heavier finished lines are much in demand. The progress of railroad building has resulted in increased business in steel rails, bridges and trestle work. In anticipation of a boom in the West as soon as the spring opens, the trade is disposed to buy largely for spring delivery.

The Algoma Steel Co., of Sault Ste. Marie, has received an order from the Canadian Pacific Railway Co. for 25,000 tons of 80-lb. steel rails. The order was given after a careful inspection of the output of the mill to ascertain whether it was up to the standard. The report of a well known Chicago testing bureau was that no better rails were produced in America. The Pere Marquette Railway Co. has ordered 3,000 tons of rails and the Michigan Central 4,000 tons, which will be used on their Canadian lines.

The Northern Iron & Steel Co., of Collingwood, the affairs of which were a good deal complicated by successive law suits brought by stockholders of the old Cramp Steel Co. to prevent reorganization under its present name, is now free from these difficulties and the company has secured a clear title.

The Canadian Foundry Co, Toronto Junction, is turning out the balance of an order of 10 locomotives for the Canadian Pacific Railway. This company will shortly commence the manufacture of Bucyrus steam shovels, wrecking trains and pile drivers, having acquired the sole right to manufacture in Canada these specialties. This will involve a considerable increase in the plant.

The blooming mill of the Dominion Iron & Steel Co., at Sydney, made its best record on Dec. 14 with an output of 462 tons.

Estate of the Late B. F. Jones.

The inventory of the estate of the late B. F. Jones, head of the Jones & Laughlin Steel Co., shows total values of $17,236,663. The holdings of stock in the Jones & Laughlin Steel Co., 101,400 shares, are valued at $11,618,412, the appraised value per share being $114.58. Based on a possible selling price of $80,000,000 for the Jones & Laughlin Steel Co., the share of the Jones estate would amount to about $45,000,000.

Newspapers at Pueblo, Col., have recently contained accounts of extensive additions which, they stated, would be made to the Minnequa plant of the Colorado Fuel & Iron Co. The financial re-organization of the company is now about completed and it is placed in possession of ample funds for future operations, but we are officially advised that there are no plans for additions or enlargements. The company is fairly well supplied with orders and is looking forward to the incoming year with the expectation of full employment for all its various departments.

The Canada Car Co. has been organized at Montreal, Can., for the purpose of erecting and operating a steel car plant. F. N. Hoffstot and J. W. Friend, president and vice president respectively of the Pressed Steel Car Co., Pittsburg, are members of the board of directors, and W. P. Coleman, ex-vice president of the American Car & Foundry Co., has been elected president and general manager.

The United Engineering & Foundry Co., Pittsburg, has sold Siviter & Co., Boston, an 18-in. mill and shears.

SEAMLESS SHEET METAL BATH TUB.

The Seamless Steel Bath Tub Co., Detroit, Mich., expects to build a plant 200 x 400 ft., to be in operation in about eight months, having a capacity from 150 to 200 tubs per day. The officers of this company are: A. B. DuPont, president and general manager; E. H. Sloman, vice president; George B. Russel, secretary and treasurer. The company will manufacture a solid steamless metal tub, porcelained on both sides and weighing about 110 pounds, which will permit a great saving in freight rates over the shipments of the present heavy iron tubs. The stockholders are: Eugene H. Sloman, George H. Russel, Antonio C. Pessano, W. C. McMillan, J. C. Hutchins, George H. Barbour, Jr., Henry Russel, H. B. Ledyard, Joseph Bover, R. A. Alger, F. H. Walker, Theodore D. Buhl, Peter White, Bryant Walker, Walter S. Russel, George B. Russel, T. H. Bowles, Henry M. Campbell, Ryerson Ritchie, William P. Stevens, Fremont Woodruff, A. E. F. White, B. F. Berry, E. L. Ford, N. D. Carpenter, DeWitt Loomis, A. B. DuPont and Albert M. Henry.

Through George B. Russel, by contract with Eugene H. Sloman, the Seamless Steel Bathtub Co. was formed, and has acquired the American patents, for the manufacture of bathtubs and kindred plumbing supplies, of a rocker roller press, invented by Charles F. Murdock some years ago. The patents had been assigned to Eugene H. Sloman, who for the past four years has been developing Murdock's process, and who at last succeeded in making a tub out of one sheet of seamless steel—the first successful solution of the problem. The personnel of the new company indicates sufficiently the sound basis of the enterprise, the list of stockholders including some of the most prominent men in the manufacturing and financial circles of Detroit. It is stated that tubs can be turned out from single sheets of copper, as well as of steel. Thus far steel from six different mills has been used and there has been no case of failure. The most intense heat does not injure the finished tubs. The expectation is that the machinery employed in the manufacture of these tubs, and on which the patents have been taken, is adapted also to the manufacture of other articles from sheet steel, opening up an important field of operation. It is probable that the new company will in time enter extensively upon the export trade.

American Society of Refrigerating Engineers.

In connection with the recent New York meeting of the American Society of Mechanical Engineers a number of engineers interested in refrigeration met in pursuance of an appointment made at a meeting held in April, called for the organization of a refrigerating engineers' association. John E. Starr, of the Starr Engineering Co., who presided at the April meeting, was again chosen chairman. An entire forenoon was given up to the discussion of constitution and by-laws as reported by the committee appointed at the April meeting. These were finally adopted, being largely modeled after the constitution and by-laws of the A. S. M. E.

The following officers were elected: President, John E. Starr; vice presidents, P. De C. Ball and H. B. Roelker; treasurer, W. C. Reed. The board of governors consists of W. E. Parsons, Henry Torrance Jr., E. L. Phillips, D. S. Jacobus, Louis Block, Edgar Penny, W. T. Robinson and Thos. Shipley. The board of governors were authorized to have the association incorporated. It will be known as the American Society of Refrigerating Engineers.

A general discussion took place as to the proper unit for determining the duty or capacity of a refrigeration machine. A resolution was adopted authorizing the president to appoint a committee of five to work with committees appointed by other engineering bodies in an effort to arrive at some definite standard for the capacity of a refrigeration machine.

The new society starts under very auspicious conditions. There will be three grades of members—active, associate and junior. The dues will be $10 a year and the initiation fee $5.

William H. Ross, Produce Exchange, New York, is secretary of the society.

Tests of the Brown Gun.

Recent tests of the Brown wire bound gun made by the Government have been very satisfactory. No other gun, the company states, ever made so good a record, which was as follows for the six shots fired by the 6-in. gun:

Date 1904	Round	Charges lbs.	Charges oz.	Velocity feet per sec.	Pressure lbs. per sq. in.
Dec. 5	1	32	4	1,913	12,274
" 5	2	48	10	2,484	20,866
" 7	3	58	—	2,879	28,500
" 7	4	64	8	3,123	36,875
" 7	5	64	—	3,178	33,450
" 7	6	64	—	3,174	37,060

Powder, gun and carriage are working satisfactorily and as the test proceeds higher pressures and velocities will undoubtedly be recorded. Results indicate that the advance calculations of Col. James M. Ingalls, made with reference to this particular gun, are correct. The Brown gun was described in *The Iron Trade Review*, March 31, 1904.

D. M. Osborne & Co. Taken Over.

D. M. Osborne & Co., Auburn, N. Y., announce that very soon their tangible property and assets will pass by purchase to the International Harvester Co. Some time ago, individuals connected with the latter company acquired a large interest in the Osborne company, but refrained from active participation in the management. The purchasing company announces that it will be its policy "to make as little change as possible in the policy of the Osborne business, and the officials and principal owners who have been so largely instrumental in the successful development of the Osborne business will be closely associated in its management in the future." President T. M. Osborne and General Manager E. D. Metcalf will continue in charge of the business at Auburn.

Eastern Pig Iron Association.

The principal producers of pig iron in the Lehigh and Schuylkill valleys have united to form the Eastern Pig Iron Association. A meeting was held last week in New York at the office of Rogers, Brown & Co., which was attended by 15 representatives of the different furnace interests. The association organized by electing B. F. Fackenthal, of the Thomas Iron Co., president; W. S. Pilling, of Pilling & Crane, secretary; Leonard Peckitt, of the Empire Steel & Iron Co., chairman; Arthur Fowler, of Rogers, Brown & Co., and Maurice Heckscher, of Richard Heckscher & Sons Co., operating the Swede furnaces, members of the executive committee. The purpose of the organization is for mutual protection; for conference in regard to sales, prices and other affairs of common interest. The association will meet once a month at various points to be designated. On Wednesday Dec. 14 the members who attended the first meeting were the guests of Rogers, Brown & Co. at dinner at the Lawyers' Club.

Among the interests personally represented were the Thomas Iron Co., the Empire Steel & Iron Co., the Pequest Furnace Co., the Swede furnaces, the Reading Iron Co., the Pioneer furnace and the Cedar Point furnace at Port Henry, N. Y. A telegram was received from the firm of E. & G. Brooke, who were unable to be personally represented.

The next meeting of the association will probably be held at Philadelphia at the office of Pilling & Crane. Meantime it is expected the membership will be increased.

The Virginia Iron, Coal & Coke Co. blew in its furnace at Bristol, Tenn, Dec. 19.

METHODS OF A MODERN INDUSTRIAL WORKS.*

BY J. WILNER HENSZEY.

The Baldwin Locomotive Works, in Philadelphia, is probably as good an example of a modern industrial works as we have in the country, and as I have been connected with this company for some years I will endeavor to give you an idea of how that plant is operated.

Baldwin Locomotive Works, at the present time, employ about 15,500 men, who are divided among 20 departments. The executive force consists of one superintendent, four assistant superintendents and 20 foremen. Owing to the extent of the works it is in two divisions, the eastern embracing all shops east of Fifteenth street, and the western division taking in all shops west of Fifteenth street, also new shops located at Twenty-sixth, Twenty-seventh and Twenty-eighth streets. Each division is in charge of an assistant superintendent, who works in conjunction with the foreman in his divison.

In the eastern division the most important shop is the erecting or finishing shop, located at Broad and Spring Garden streets. This shop employes about 2,500 men, and has a capacity of 50 finished locomotives every week. To operate this department we have one foreman, two assistant foremen and twenty track foremen. Every track foreman is a specialist in a certain line, such as erecting, valve-setting, testing, etc., and has direct charge of the gang bosses and men who work under his supervision. The gang bosses, or contractors as we call them, are all picked men, the very best we can find, and have direct charge of the workmen. This same system of contracts is employed in every department throughout the works.

Contract System.

I will now explain our contract or piece-work system. Every department is a factory, manufacturing a certain number of locomotive parts. Through careful study we are able to ascertain the exact time and expense involved in making these parts. We then allow a certain amount of profit for the contractor in making the price. He in turn gives out his work—piece-work—to his men at a slightly lower rate and makes the difference. There is a great diversity of opinion among manufacturers about the best way to pay labor. Some claim that you do not get the best results from the piece-work system because a piece worker knows that he will not be allowed to make over a certain amount, and if he finds that he is making too much he will curtail his output sooner than run the chance of having his prices cut. This is true in some cases, but, under careful management, on routine work cannot occur. We expect and get more work per man out of our piece workers than any similar concern in the world, and our men are allowed to make higher wages; and this, to my mind, explains why we never have strikes at Baldwin's.

In hiring a man we never ask whether he belongs to a union or not. We don't care. If he enters our employ he abides by our rules and regulations, which are posted in every department, and any attempt to incite trouble or dissatisfaction among the men is reported at once by his contractor and the man is dismissed.

A question that is often asked is, "Do you not have great trouble in procuring workmen who are skilled in the special lines of locomotive works?" We do. This is the question to which the Baldwin firm has given a great deal of attention in the past four years, and has led to the revival in our works of the old apprenticeship system, a brief outline of which may be interesting.

Apprenticeship System.

The apprentices are divided into three classes, first, second and third. To be a first class apprentice a boy must be 17 years old and must have at least a grammar school education. He serves four years. During this time he is allowed to stay on one class of work only three months, and is moved from department to department until he covers the entire plant. During the school season he is obliged to attend night school two nights a week, taking up a special course in higher mathematics and mechanical drawing. He is paid from $3 to $6.60 per week during apprenticeship, and on completion of time receives a certificate and $250. A second class apprentice must be a high school graduate and serve three years on same lines as first class apprentice. He also attends night school. He gets from $4.20 to $6.60 per week, and on completion of time receives a certificate and $200. A third class apprentice must be a graduate of a recognized technical school. He serves two years and does not take a night course. He gets from $9 to $12 per week and receives a certificate on completion of time. We now have between 400 and 500 apprentices of the several classes, and it is proving of vast benefit to the works in providing a more intelligent and better class of labor than it is possible to get in any other way.

We claim that whether the apprentice stays with us or not on the completion of his time, he will always be a friend to the Baldwin Locomotive Works and look out for our interests, just as a college man does for his college. His training has made him a valuable man for railroad work, and one who will get ahead. It is a far-sighted business proposition.

A manager of a large shop has many other important matters to look after. If he is a progressive man, backed by a progressive firm, he wants to know the quickest and best way to get out work. Our firm encourages this among the foremen, and sends them all over the country to see how other people do work. If a foreman can prove that by the use of certain tools and appliances he can save time and expense, they are furnished him without question. During the past five years enormous strides have been made in this direction. By the aid of improved hydraulic and pneumatic tools hand work has been reduced to a minimum, and on this alone nearly $1,000,000 a year is being saved on the cost of work in the shops. We have also made great savings on time required to do work by the use of specially treated tool steel for machine tools. By means of these tools we have been able to increase the capacity of some of our machines from 30 percent to 50 percent. Our best results have been obtained from the Burgess special steel and the Sanderson special steel. All our new tools are being made from these steels, as ordinary tool steel will not stand the high speeds at which our tools are now being run.

Shop Methods.

It is interesting to see the vast difference between an up-to-date railroad or locomotive shop in this country and a similar shop on the other side. It has been my opportunity to visit a number of these shops in England, Sweden, Finland and Russia, and it is surprising to note the condition of their equipment. Power cranes are very rare, even in the larger shops and the machinery is of a type in use here 25 or 30 years ago. It is not strange, noting these conditions, that we can build locomotives in Philadelphia, ship them to any country in Europe, and put them in service on their railroads 10 to 20 percent. cheaper than they can build in their own shops.

As orders for locomotives are received, they are printed on lists and put out in the shops. Each list contains two weeks' work; they are dated with delivery dates for each class of work in the various departments. The designation of the different classes of locomotives as used by Baldwin Locomotive Works embodies the combination of certain figures with one of the letters *A, B, C, D, E* and *F*, to indicate both the number and kind of wheels and the size of cylinders. Thus, a locomotive having one pair of drivers is classed *B;* that with two pairs, *C;* that with three pairs,

*Read before the Franklin Institute and reprinted from the Journal.

D; that with four pairs, *E;* and that with five pairs, *F.* The letter *A* is used for a special class of high-speed locomotive with a single pair of drivers. A figure 4, 6, 8, 10, 12 and 14 is used as an initial figure to indicate the total number of wheels under a locomotive. A figure or figures following the initial figure indicates diameter of cylinders, and the figure or figures following a class designation represents the consecutive class number of a locomotive on which is appears. Thus, 8 26 *C* 500 indicates a locomotive with eight wheels in all, having cylinders 16 inches in diameter with two pairs of driving wheels, and the 500 locomotive of its class. As soon as lists are put out, the drawing rooms get them and start at once to design the locomotive, furnishing bills of material to the purchasing department, which orders all material we do not make. Lists are also furnished to every foreman and contractor in the entire plant. The great advantage of these lists is that every man in the entire works is after the material he needs long before it is wanted in the erecting shop, and we are rarely subjected to delay on delivery dates. Every foreman has a book of lists—check books we call them—in which he keeps an exact daily check of every piece of work made in his department. He, in turn, checks off the superintendents' who can tell by their books at a glance the exact condition of every locomotive part in the entire works.

System of Accounts.

An important factor in the management of a large plant is the system of accounts.

The Baldwin Locomotive Works keep two sets of accounts, viz.: the manufacturing account and the commercial or financial accounts.

In the manufacturing books a ledger account is kept with each locomotive constructed and with each repair work job. All materials and labor are charged to these accounts either directly or eventually on closing the books. The principle is that no material or labor is paid for without being charged to an appropriate account. In the commercial books accounts of dealings with individuals and corporations are kept in the ordinary way. Both sets of books are closed annually and correspond exactly in their statements of expenditures and receipts.

In the general system of accounts by which the cost of construction of locomotives is ascertained each locomotive is charged as follows:

A. *Materials.*—All materials used in the construction of the locomotives at the actual cost as fixed in the general contracts covering such purchases, or as paid for same at market rates.

B. *Distributed Labor.*—All labor charged directly to the locomotives at actual cost of same, either by piece work or day work rate.

C. *Expenses.*—All labor and materials incident to the construction of the locomotives, but which from their character cannot be charged direct. The cost of these is distributed to the locomotives in the proportion fixed by the amount of distributed labor as per paragraph B. Until this proportion is finally determined for each year it is based upon the accounts for the preceding year. The expenses include wages of managers, foremen, clerks, draughtsmen, stationary engineers, teamsters, laborers, watchmen, traveling engineers and messengers. They also include heating, lighting, repairs, insurance, taxes and other expenses on buildings, and tools, patterns and dies, defective work, printing, advertising, traveling expenses and all incidental costs connected with manufacture.

D. *Disbursements for Freight and Delivering Locomotives.*—These consist of railroad charges for transportation to point of delivery.

The aggregate of the foregoing items is the cost of manufacture and delivery of locomotives.

Test Department.

One of the most important departments and one whose influence is felt over the entire works is the test department. This is equipped with two Tinius Olsen testing machines for physical tests, and a complete chemical laboratory for chemical analyses, also with apparatus for indicating locomotives and stationary engines. Nearly all the material we use must first pass through this department, and be reported on before being accepted; this applies to all boiler steel, spring steel, tank steel, bar iron, cylinder iron, steel castings, oils, paints, etc. We have fixed standards for all these materials, which must be complied with before materials are accepted. The test department also has a corps of inspectors, who are stationed in the various rolling mills and steel plants we deal with, and whose duty it is to see that our mills specifications are lived up to, and that our orders are rushed through.

Shop Detail.

One of the important duties of a shop manager is the care of machinery. These machines represent thousands of dollars, and it is of the utmost importance that they be kept in perfect repair. To accomplish this we have in every shop a machine inspector or tool boss. This man is an expert on repair work, and has a gang of machinists under his supervision. As soon as a machine breaks, the fact is reported to the tool boss, who repairs it at once. A number of duplicate pieces of the most breakable parts of machines are always kept in stock, so that the machines are seldom down but for a very short time.

In every large plant, especially one having large smith shops and foundries, there is a constant danger of fire; to overcome this we have, I think, one of the largest volunteer fire departments in the country, having about 200 picked men scattered all over the works. We have 12 large Barr pumps and as complete apparatus as the city department. Every shop also is equipped with a sprinkler system, and has stand-pipes and reels of hose on every floor. Every few weeks we have fire drills, and it is remarkable how quickly our men can get into service. They put out on an average of two or three fires a month, and for several years have not had to call on the city fire department.

Another important matter is shop cleanliness. The sweepings must be run through separators, then loaded on cars and sent to firms why buy all our turnings. Our sheet-iron scrap is carted to large scrap-bins built over railroad tracks in one of our yards. These bins have hinged bottoms, and when they are full, cars are run under them and loaded. This material is also sold, and proceeds from scrap and turnings amount to several hundred dollars a week.

The power of the works is handled by the highway department, which is also responsible for buildings, electric power and light and machinery repairs. We have four large power-houses, one at Broad street, one at 16th street, one at 17th street, and one at 27th street, having 31 boilers generating 10,684 horse power. Each power house is in charge of a chief engineer, who makes a daily report to the highway department office on a special form, giving an hourly account of steam and air pressures, and of the boilers, engines and compressors that were in service. By this means the foreman of the highway department is kept in contact with the power service throughout the entire works, and knows exactly how the pressures are being maintained at every hour of the day. We have 108 engines, pumps and air compressors, with 8,656 horse power. All air compressors, dynamos for light and power and engines running them are located in power houses, the other engines being located in the various shops.

Time and Pay Departments.

As I have already stated, we employ 15,500 men, and to keep account of their time and wages is the work of our time department. Each man, on being hired, is given a number. The numbers for the men in each shop run in rotation. Each contractor has a piece work book, in which he keeps a daily account of the time and wages made by

each man in his gang. The time of all day workers is kept in a day work time book by the time clerk. Once a week the time department takes the time records from the piece and day work books, entering the same on long printed sheets, giving the name and number of every man in each department. The piece work books are gone over, and charges against each locomotive are entered to its cost account. The account of the wages due each man is then turned over to the pay department.

The pay department has pay envelopes stamped with the name and number of every man in the entire works. The amount of wages due is now stamped on each envelope. Our regular pay day, with the exception of holidays, is on Friday, and every Friday morning the money is brought from bank. It has always been our custom to pay in coin, which is easier to handle, and clerks are less liable to make mistakes. The amount stamped on each envelope is then put in, the envelope is sealed and all are arranged in rotation, as to number, in an upright position, in specially constructed racks, each rack holding about 200 envelopes. These racks when filled are put in safes built for this purpose, and are now ready for the paymasters. We have two pay stations—one at Broad street, in the Erecting Shop, and another at Seventeenth and Hamilton streets. At the signal to quit work on Friday night, the men arrange themselves in long lines, according to number, at their respective pay stations, and at five minutes after six the line starts. We have eight paymasters, and run eight lines, the foreman of each shop, and his assistants, having charge of the lines his men are in. Each man as he passes the pay desk calls out his number to his foreman and his name to the paymaster, who passes him his envelope. It is possible in this way to pay our entire force in thirty minutes.

In conclusion, I will say that, to my mind, to get the best results from a shop you must have a unity of feeling among your men. Every man should be treated as a man, not as a machine. If a man comes to tell you about a supposed or a real wrong, he should be listened to, and given the proper advice. Your superintendents and foremen should not be shut up in offices to which the ordinary workman cannot have access, but should be as get-at-able as possible. This is, and has been, the policy of the Baldwin Locomotive Works, and to this policy their success, I believe, may be in large measure attributed.

The Pittsburg Steamship Co. has sold four of its whaleback barges to the Baltimore & Boston Barge Co. The barges, which are now laid up at Erie, will go to the coast next spring where they will be operated in the coal trade. The combined carrying capacity of the four barges is 9,963 gross tons, which is less than the carrying capacity of one of the big steamers building for the company.

I. N. Perry, formerly a bank president, who was accused of setting fire to the Chicago Car & Locomotive Works to obtain the insurance, was discharged Dec. 9 after a hearing extending over several weeks. The evidence shows that there had been a conspiracy against Perry for months. The principal witnesses against Perry were his former employes, who, it is alleged, were a party to the conspiracy.

A director of the American Locomotive Co. states that there are no indications at present that the common stock of the company will receive dividends. He says that while there has been a considerable increase in business, prices are low and profits are not nearly as large as they were a year or two ago.

John McLean, a stockholder of the Avondale Stove Foundry Co., Avondale, Ala., has filed a bill in equity, asking for the appointment of a receiver for the company.

IRON AND STEEL WORKS OF CANADA.

In the current issue of the *Bulletin* of the American Iron and Steel Association is given a complete directory of the iron and steel works in Canada, including all such works as are now active or may possibly be active. This Canadian list supplements the directory of the iron and steel works of the United States published by the association a few months ago. There are in Canada 16 completed blast furnaces and 3 projected. The latter will all use coke; of the former 11 are coke furnaces and 5 charcoal. The annual capacity of the completed furnaces is 755,000 gross tons of coke pig iron and 75,000 tons of charcoal pig iron; total 830,000. The number of rolling mills and steel works in Canada is 18 completed, 3 building, and 2 projected. Of these 1 makes Bessemer steel, 1 has an idle modified Bessemer converter, 1 makes Tropenas steel, 5 make open-hearth steel, and 1 open-hearth steel plant and 1 plant for the manufacture of steel by the Hunter process are being built. The annual capacity of built and building plants on double turn is as follows: Standard Bessemer and Tropenas ingots and castings, not including the idle modified Bessemer converter, 200,800 gross tons; open-hearth ingots and castings, 451,000 tons; Hunter steel castings, 1,500 tons: total ingots and castings, 653,300 tons; total finished rolled and forged products, 8396,600 tons.

Nova Scotia Blast Furnaces—8.

Dominion Iron & Steel Co., Ltd., Sydney, Cape Breton county. Four stacks, each 85 x 20, and each equipped with four Cowper-Kennedy stoves. No. 1 blown in Feb. 4, 1901; No. 2 May 9, 1901; No. 3 Oct. 21, 1901; and No. 4 Jan. 18, 1902; fuel, coke, obtained from the company's ovens; ores, Wabana red hematite from the company's mines on Belle Island, Newfoundland, and American Lake Superior and foreign; product, basic and foundry pig iron; total annual capacity, 400,000 gross tons. A coke plant containing 400 Otto-Hoffman by-product ovens and 50 non-recovery ovens, with a total annual capacity of 450,000 net tons, is connected with the furnaces; also a coal washing plant with a capacity of 200 tons per hour. J. C. Mackley, furnace superintendent..

Londonderry Iron & Mining Co., Ltd., Montreal, Que. Works at Londonderry, Nova Scotia. Two stacks: Furnace A, 75 x 17, and Furnace B, 62 x 18, built in 1875-6 and blown in in 1877; Furnace A rebuilt in 1883, 1891, 1895, and 1903; three Siemens-Cowper fire-brick stoves; fuel, coke made from coal mined in Pictou and Cumberland counties; ores, limonite, carbonate, and red hematite from mines owned by the company in Colchester and Annapolis counties; product, foundry pig iron; annual capacity, 60,000 tons. Connected with the furnaces is a coal-washing plant with an annual capacity of 60,000 net tons; also a plant containing 97 coke ovens with an annual capacity of 40,000 net tons; also a machine shop; also a cast iron pipe foundry, owned and operated by the Montreal Pipe Foundry Co., Ltd., of Montreal. Thomas J. Drummond, president, Edgar McDougall, vice president, and F. G. O'Grady, secretary and treasurer, Montreal; George Beatty, superintendent, Londonderry. Furnace B is idle and is likely to remain long inactive.

Nova Scotia Steel & Coal Co., Ltd., New Glasgow. Two stacks: Ferrona Furnace, at Ferrona, one stack, 65 x 15; three Massicks & Crooke stoves. Sydney Mines Furnace, at Sydney Mines, one stack, 85 x 17; four Roberts stoves. Fuel, coke made from coal mined near the furnaces; ores, local brown and red hematite and Wabana from Newfoundland; product, foundry and basic pig iron; total anual capacity, 90,000 gross tons. David Aikens, superintendent.

Number of coke furnaces in Nova Scotia: 8. No charcoal furnaces.

Rolling Mills and Steel Works—3 Completed and 1 Building.

Dartmouth Rolling Mills, Ltd., Dartmouth; 4 heating furnaces, 2 trains of rolls (one 10 in. and one 18 in.), and 2 hammers; product, bar iron; annual capacity, single turn,

10,800 gross tons. Fuel, coal. James Simmonds, president; C. H. Lissemore, vice president; H. E. Hill, secretary and treasurer.

Dominion Iron & Steel Co., Ltd., Sydney. Built in 1900-1; 4 pit heating furnaces and ten 50-gross-ton Campbell basic open-hearth steel tilting furnaces; first open-hearth steel made Dec. 31, 1901; one 35-inch direct reversing blooming and billet mill and one Morgan continuous billet mill with 6 stands of 16-inch rolls; blooming mill and continuous billet mill; one Morgan continuous rod mill, with 14 stands of 12-in. roughing and 10-in. finishing rolls, added in 1904; first wire rods rolled in May, 1904. Annual capacity, 250,000 gross tons of ingots, 225,000 tons of blooms, billets, and slabs, and 60,000 tons of wire rods. Fuel, manufactured gas. Adding one 28-in. continuous rail train, with estimated capacity of 500 tons per shift. The company has purchased one 128-inch plate mill, but it will not be installed at present. J. H. Plummer, president; Graham Fraser, director of works; Joseph Dix Fraser, assistant to director of works; W. B. Ross, secretary; C. S. Cameron, acting treasurer and comptroller; F. P. Jones, general sales agent; William Brown, superintendent of open-hearth steel plant; W. D. Jones, superintendent of rolling mill department.

Nova Scotia Steel & Coal Co., Ltd., New Glasgow. Two works, one completed and one building. New Glasgow Works (completed) at New Glasgow; forge built in 1872; steel plant added in 1882; hot trains added in 1883; 12 forge fires, 12 coal and 5 gas heating furnaces, 6 trains of rolls, 5 hammers (from 10 cwt. to 5 tons) and for basic open-hearth steel furnaces (three 40-ton stationary and one 50-ton tilting); product, railway, marine, and engine forgings, car axles, mine rails, machinery, spring, and agricultural implement steel, steel plates, angles, and iron and steel merchant bars; annual capacity, 60,000 gross tons of ingots and 50,000 tons of finished product. Sydney Mines Steel Works (building) at Sydney Mines, Cape Breton county; four 40-ton basic furnaces; annual capacity, 60,000 tons ingots; fuel, bituminous coal; will probably be completed in the spring of 1905; trains of rolls may be added. Office of president vacant; James D. McGregor, vice president; Archibald McColl, secretary; Thomas Cantley, general manager.

NEW BRUNSWICK.

Rolling Mills—1.

Portland Rolling Mills, Ltd., Strait Shore, St. John. Works built in 1856 and rebuilt in 1889; 1 single puddling furnace, 8 heating furnaces, 4 trains of rolls (9, 12, and 18-in. bar and 18-in. nail plate), 3 railway spike machines, one 5-ton helve hammer, 38 cut nail machines, and 18 tack and shoe-nail machines; also a complete set of horseshoe machinery; product, bar iron, car axles, nail plate, street and mine rails, fish-plates, ship and railway spikes, knees for ships, shafting, cut nails, shoe nails, tacks, horseshoes, bolts, nuts, etc.; annual capacity, 10,000 tons of rolled products, 150 tons of shoe nails and tacks, 31,000 kegs of cut nails, 2,300 tons of ship and railway spikes, 14,000 kegs of horseshoes, and 900 kegs of bolts and nuts. James Manchester, president; D. J. Purdy, vice president; William Bruckhof, treasurer; A. P. Macintyre, secretary.

QUEBEC.

Charcoal Blast Furnaces—3.

Canada Iron Furnace Co., Ltd., Montreal. Furnace at Radnor Forges. One stack, 46 x 8, fuel, charcoal; ores, lake and bog from the company's mines; product, special charcoal pig iron for car wheels, chilled rolls, etc.; annual capacity, 10,000 gross tons. George Gudewill, president, 26 W. 52d street, New York; George E. Drummond, managing director and treasurer, and Thomas J. Drummond, secretary, Montreal; John J. Drummond, general superintendent, Midland, Ont.

McDougall (John) & Co., Montreal. Furnaces at Drummondville. Grantham Furnace, 35 x 10, built and blown in in 1880; St. Francis Furnace, 32 x 9, rebuilt in 1897; warm blast; ore, local limonite; product, car wheel pig iron; total annual capacity, 4,000 tons. George McDougall, manager.

Rolling Mills and Steel Works—5.

Grand Trunk Railway Rolling Mill, Montreal. Works at Point St. Charles, Montreal; 2 heating furnaces and one 3-high 12-in. train of rolls; product, bars, angles, and tees; annual capacity, 7,000 gross tons. A. A. Maver, superintendent.

Montreal Rolling Mills Co., Montreal. Works at Ste. Cunegonde, 10 heating furnaces and 3 trains of rolls (9-in., 12-in., and 18-in.); product, bar iron and bar steel, horseshoe iron, railway joints, angle bars, tie plates, nail plate, and skelp; annual capacity 25,000 gross tons of rolled iron and steel and 12,000 tons of skelp. The works also have an annual capacity of 75,000 kegs of horseshoes, 30,000 boxes of horse nails, 15,000 tons of wire, and 200,000 kegs of wire nails. Connected with the works is a plant for the manufacture of wrought iron and steel pipe; also a galvanizing plant; annual capacity, 15,000 tons. The company also makes tacks, staples, etc. E. S. Clouston, president; William McMaster, vice president and general manager; James L. Waldie, secretary; J. R. Kinghorn, general sales agent; Charles J. Hempey, purchasing agent; M. F. Derrick, superintendent of works.

Montreal Steel Works, Ltd., Canal Bank, Point St. Charles, Montreal. One 3,000-lb. modified acid Bessemer converter added in 1897 and first steel made in that year (idle); one 15-ton acid open-hearth steel furnace added in 1901; 15-ton acid furnace built in 1903; product, steel castings for railway, mining, and other purposes; annual capacity, 9,000 tons. Also make springs, switches, and track work for steam and electric roads; also gray iron castings. K. W. Blackwell, president and managing director; J. R. Wilson, vice president; C. H. Godfrey, secretary and treasurer; G. D. Smith, superintendent.

Peck Rolling Mills, Ltd, Montreal. Works on Lachine Canal. Partly burned in 1903 and rebuilt. Equipped with heating furnaces, trains of rolls, cut and wire-nail machines, tack machines, horseshoe machines, etc.; product, bar iron and steel, shovel plate, railway spikes, ship spikes, cut nails, wire nails, tacks, horseshoe nails, iron and steel horseshoes, etc. Thomas Peck, president; F. C. Skelton, vice president; E. J. Fry, secretary and treasurer; T. E. Peck, general manager.

Pillow & Hersey Manufacturing Co., Ltd, Montreal. Operated by the Montreal Rolling Mills Company. Rolling mills, cut-nail, and spike works, bolt, nut, and rivet works, 6 heating furnaces, 3 trains of rolls (9-in., 12-in., and 18-in.), and 96 cut-nail machines; product, bar iron and bar steel, cut nails, railway and pressed spikes, bolts, nuts, rivets, and washers; annual capacity, 25,000 gross tons of bar iron and steel, 100,000 kegs of cut nails, 80,000 kegs of railway and pressed spikes, and 5,000 tons of bolts, nuts, etc.

ONTARIO.

Blast Furnaces—5 Completed and 3 Projected

Algoma Steel Co., Ltd., Sault Ste. Marine. Two completed stacks and two projected. Furnace No. 1 (charcoal) 70 x 13½, built in 1901-3; three Foote fire-brick stoves. Furnace No. 2 (coke) 80 x 15½, blown in Oct. 17, 1904; four fire-brick stoves; fuel, Pennsylvania and West Virginia coke; product, Bessemer pig iron; estimated annual capacity, 90,000 tons. Plants for the manufacture of charcoal, containing 20 retorts with a daily capacity of 160 cords of wood and 50 bee-hive kilns with a daily capacity of 180 cords, are also operated; also plants for manufacture of wood alcohol and acetate of lime. R. H. Sweetser, superintendent of furnaces.

Deseronto Furnace, Deseronto Iron Co., Ltd, Deseronto. One stack, 61 x 9½, two iron pipe stoves; fuel, charcoal; ores, American, from the Lake Superior region, and small quantities of local; product, malleable and car wheel pig iron; annual capacity, 11,000 gross tons. William Gerhauser, president; F. A. Goodrich, vice president; F. B. Gaylord, secretary, treasurer, and manager.

Hamilton Furnace, Hamilton Steel & Iron Co., Ltd, Hamilton. One stack, 75 x 16, one Roberts and three Gordon-Whitwell stoves; fuel, Connellsville coke; ores, Lake Superior hematite and Ontario hematite and magnetic; product, foundry and basic pig iron; annual capacity, 70,000 tons.

Midland Furnace No. 1, Canada Iron Furnace Co., Ltd, Montreal. Furnace at Midland. One stack, 64 x 13, three two-pass fire-brick stoves; fuel, Connellsville coke; ores, Michipicoten and American Lake Superior; product, foundry, malleable Bessemer, and Bessemer pig iron; annual capacity, 45,000 gross tons. John J. Drummond, general superintendent.

Northern Iron & Steel Co., Ltd., Toronto. Excavations made in 1902 at Collingwood, by the Cramp Steel Co., Ltd., for one 250-ton coke furnace; work indefinitely suspended in 1903; property acquired by Northern Iron & Steel Co., Ltd., in September, 1904; work on the furnace is not likely to be resumed in the near future.

Rolling Mills and Steel Works—9 Completed.

Algoma Steel Co., Ltd., Sault Ste. Marie. Two 6-gross-ton Bessemer steel converters, 3 Siemens heating furnaces, 4 iron and 3 spiegel cupolas, and one 23-in. combined rail and structural train; product, steel ingots, rails, and splice and angle bars; annual capacity, 200,000 gross tons of ingots and 180,000 tons of rails and other finished rolled products. C. D. Warren, president and receiver, Toronto, Ont.; W. F. Hobbie, secretary, and John T. Terry, Jr., treasurer, New York City; Willard N. Sawyer, general manager; J. S. Wynn, auditor, and D. D. Lewis, superintendent, Sault Ste. Marie.

Hamilton Steel & Iron Co., Hamilton. Three mills in Wentworth county, two at Hamilton and one at East Hamilton; Hamilton Mills—2 busheling furnaces, 4 double puddling furnaces, 9 coal heating furnaces, 5 trains of rolls, 3 hammers, and 45 cut-nail machines; product, bar and band iron and steel, fish-plates, nail plate, forgings, cut nails, rivets, and washers; annual capacity, 27,000 gross tons of finished products and 100,000 kegs of cut nails. East Hamilton Mill, built in 1900; 1 heating furnace and 2 trains of rolls; product, steel bars; annual capacity, 18,000 tons. Open-hearth steel plant added to the East Hamilton mill in 1900; now contains three basic furnaces (one 30-ton and two 15-ton); annual capacity, 36,000 tons. Fuel, Pennsylvania bituminous. C. S. Wilcox, president; Charles E. Doolittle and A. E. Carpenter, vice presidents; Robert Hobson, general manager; W. A. Child, treasurer; H. H. Champ, secretary.

Iron & Steel Co., of Canada, Ltd., Belleville. Equipped with machinery from the dismantled plants of the Thames Iron Works, of Norwich, Conn., the Nashua Iron & Steel Co., of Nashua, N. H., and the Metropolitan Rolling Mills, of Montreal; 7 heating furnaces, 3 annealing furnaces, 3 trains of rolls, 9-in., 12-in., and 18-in.; 36 cut nail machines, and 2 spike machines; product, bar iron, bar steel, cut nails, horseshoes, ship and railway spikes, track bolts, washers, etc.; annual capacity, 12,000 gross tons rolled products and 50,000 kegs of spikes. M. Wright, president; D. Jackson, vice president; J. F. Wills, managing director, secretary, and treasurer; E. Renshaw, superintendent.

Wm. Kennedy & Sons, Ltd., Owen Sound. One 2-gross-ton Tropenas steel converter; product, machinery and other steel castings; annual capacity, 400 tons. Fuel, coke. A gray iron foundry connected, also machine shop. M. Kennedy, Sr., president and manager; William Kennedy, Jr., vice president; Ewing Cameron, secretary and treasurer.

London Rolling Mill Co., Ltd., London. 1 scrap furnace, 2 busheling furnaces, 2 heating furnaces, 3 trains of rolls, (18-in. muck, 14-in., and 10-in.), and 1 squeezer; product, merchant bar iron and steel, bolts, nuts, hinges, etc.; annual capacity, 15,000 gross tons of rolled products and 6,000 tons of bolts, nuts, hinges, etc. John White, president; J. Frank White, vice president; Charles H. White, manager.

Northern Iron & Steel Co., Ltd., Toronto. Works at Collingwood. Built in 1901-3 by the Cramp Steel Co., Ltd.; not operated down to Dec. 1, 1904; two 20-gross-ton basic open-hearth steel furnaces with an annual capacity of 36,000 gross tons of ingots, 2 reverberatory ingot heating furnaces, and 2 trains of rolls (10-in. and 18-in.); product, billets, round, square, and flat bars, wire rods, angles, plow beams, wagon tires, shafting, girders, street rails, mine rails, bolts, rods, hoops, etc.; annual capacity, 30,000 gross tons. J. A. Currie, president and general superintendent; Duncan Donald, secretary and treasurer.

Ottawa Steel Casting Co., Ltd., Ottawa. Building works at Ottawa with two furnaces for manufacture of steel by Hunter process; product, steel castings; estimated annual capacity, 1,500 gross tons. J. B. MacLaren, president and managing director; Arnley Quackenbush, vice president; G. M. MacLaren, secretary and treasurer; George G. Roe, manager.

Toronto Bolt & Forging Co., Ltd., Toronto. Works at Sunnyside, Toronto. Three coal heating furnaces, 2 double busheling furnaces, and 3 trains of rolls (12-in., 9-in., and 22-in.); product, merchant bar iron, agricultural implement and carriage iron, channels, angles, beveled-edged flats, etc.; annual capacity, single turn, 6,000 gross tons. Fuel, bituminous coal from the United States. The company also operates works at Swansea and Gananoque in Ontario, for the manufacture of bolts, nuts, spikes, rivets, carriage hardware, and drop forgings. George Gillies, president; T. H. Watson, secretary and treasurer; John Stephens, general superintendent; C. O. Jolley, assistant superintendent.

Projected Rolling Mills—2.

Imperial Steel & Wire Co., Ltd., Collingwood. Works for the manufacture of iron and steel wire and wire nails built at Collingwood in 1904; first put in operation Nov. 28, 1904; number of wire-drawing blocks, 12; number of wire nail machines, 20; annual capacity, 15,000 gross tons of wire and 120,000 kegs of wire nails. Fuel, coal. A galvanizing plant, a plant for making kegs, and a plant for the manufacture of woven wire fencing are being built. Trains of rolls for the manufacture of wire rods will probably be added in 1905. J. A. Currie, president and general manager, Collingwood; B. S. Wood, vice president, London; W. J. Lindsay, vice president; and Duncan Donald, secretary and treasurer, Toronto.

Page-Hersey Iron & Tube Co., Ltd., Guelph. Wrought iron pipe plant; equipped with two forge fires and one butt-welding furnace; sizes, ¼ in. to 3 in.; annual capacity, 15,000 gross tons of pipe. A galvanizing plant connected. Fuel, bituminous coal. Contemplates adding a rolling mill. Product to be skelp and bar iron; estimated annual capacity, 17,000 gross tons. W. W. Near, president and managing director; D. H. Friedman, vice president; R. E. Mills, secretary; H. Westoby, treasurer; A. M. Mosley, superintendent; J. Mosley, assistant superintendent.

MANITOBA.

Building Rolling Mills—1.

Kirkwood Iron & Steel Rolling Mills, T. M. Kirkwood, owner, Winnipeg. Building rolling mill, to be equipped with 2 heating furnaces, 4 spike machines, 4 bolt machines and 2 trains of rolls (9 in. and 16 in.); product, bar iron, railway spikes, bolts, etc.; estimated annual capacity, 10,000 gross tons of bars and 5,000 tons of spikes. May erect two additional heating furnaces.

The Neafie & Levy Shipbuilding Co., Philadelphia, made an assignment Dec. 9 to John W. Grange. The company recently completed the cruiser Denver for the Government, and is now constructing the protected cruiser St. Louis. It is understood that the financial loss on work for the Government caused the embarrassment of the company.

Otto Konigslow, of Cleveland, a manufacturer of machinery, has filed a petition in bankruptcy, giving liabilities as $33,598 and assets, $35,058.

FOUNDER OF THE McINNES STEEL CO.

The success of the tool steel made by the McInnes Steel Co., as reported in detail in the last issue of *The Iron Trade Review*, will add interest to the biography of Alexander McInnes, founder of the firm. He was born in Scotland in 1847 and learned the blacksmith's trade in his father's shop. At 23 years of age he came to the United States and for a year was employed in New York. Thence he went to Pittsburg and worked for Wilson & Walker at the "Old Bumper Works," now the Carnegie 29th street mills, and was then called to St. Louis as superintendent of the Helmbacker Forge and Rolling Mill where he spent six years. Afterwards he entered the employment of the Laclede Car Co. of St. Louis and while so engaged received an offer from the Carnegie Steel Co. to return to Pittsburg. Mr. Innes accepted and for six years was superintendent of the forge, resigning about the time of the Homestead strike with a view to engaging in the forging business. The panic of 1893 changed his plans and he became superintendent of the Bovaird & Seyfang Mfg. Co. of Bradford, Pa. When the Emporium Steel Co. started the new plant at Emporium, Pa., Mr. McInnes undertook the starting of the works with his sons John J. and Alexander. The process attempted was subsequently abandoned and Mr. McInnes and his sons purchased the plant and operated it for some seven years as the McInnes Steel Co. The inadequate shipping facilities at Emporium made a change necessary and about three years ago the works were moved to Corry, Pa., the present location.

ALEXANDER M'INNES.

The Alliance Machine Co., Alliance, O., has made its fifth shipment to the Cerro de Pasco Mining Co., Cerro de Pasco, Peru, S. America, consisting of one 60-ton electric traveling crane and one 10-ton electric traveling crane, both operated by alternating current. One large accumulator, ten mold cars, and one hundred tons of special machinery for a copper converter plant. It required seven cars to convey this shipment to New York.

The Harbison-Walker Refractories Co., Pittsburg, has issued its financial statement which shows a net profit of $949,393 for the year. The report shows surplus Sept. 30, 1903, of $678,094; added during year, $209,830; making a total of $887,924. The property account is $28,744,187.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants:—

The Belle-Charest Mfg. Co., Nashua, N. H., has been incorporated with a capital of $235,000, to manufacture shoe stock machinery. Incorporators are: P. Bell, Montreal, the inventor; J. C. B. Charest, Montreal; Dr. J. A. Charest, H. C. Phaneuf, and Alfred B. Collette, Nashua.

The National Sheet Metal Co., Peru, Ill., has been incorporated with a capital of $60,000. Incorporators are: Henry Ream, Paul Brauns and George Seedler.

The National Smoke Consumer Co., Chicago, has been incorporated with a capital of $10,000. Incorporators are: Noah Cornfield, J. H. McCulloch and Charles C. Tillman.

The Queensborough Boiler Works, Queensborough, N. Y., have been incorporated with a capital of $10,000. Directors are: F. G. Conway, K. Daly, J. J. Conway, Long Island City.

The Lewis F. Shoemaker Co., Pottstown, Pa., has been incorporated with a capital of $200,000, divided into 2,000 shares. The directors are: L. F., B. H., and Anna M. Shoemaker and T. C. Satterthwait.

A. P. Dienst & Co., Third avenue and 140th street, New York, will soon be in the market for pipe threading and cutting machines, machine shop equipment, gas engine and a belt power elevator for their new building.

The Braden Mfg. Co., Terre Haute, Ind., has been incorporated with a capital of $20,000. Incorporators are: W. A. Braden and John H. Viehe, Petersburg, Ind., and William E. Williams, Marshall Williams, G. W. Bohnut and Elmer Brock, of Terre Haute.

The W. H. Mullins Co., Salem, O., has been incorporated with a capital of $300,000, to do metal and wood working. Incorporators are: W. H. Mullins, R. J. Thompson, W. O'Hare, W. P. Parpenter and J. H. Blackburn.

The Florida Bed Mfg. Co. has been incorporated with a capital of $10,000, to manufacture wire springs of all kinds, mattresses, etc. Officers are: F. H. Elmore, president; J. C. Connally, vice president and general manager and J. C. Russell, secretary-treasurer.

The Koplin Iron Co., Atlanta, Ga., has been incorporated with a capital of $10,000. Incorporators are: K. Koplin, S. M. Samuels and W. D. Ellis, Jr.

The City of Cleveland will expend $20,000 in the purchase of boilers, engines and pumps for the city farm school.

The Hanks Foundry Co., Rome, Ga., is in the market for foundry equipment.

Application has been made for a charter for the Ruth Machine Co., York City, Pa., which has been organized with a capital of $40,000 and taken over the plant of the Ruth Automatic Knitting Machine Co., which was sold some time ago under the insolvent laws. The new company has purchased the former company's plant with its fixtures.

The Appliance Mfg. Co., New York, has been incorporated with a capital of $1,000,000. Incorporators and directors for the first year are: W. G. Hague, New York; C. T. Balcom and R. G. Johnson, Brooklyn.

The General Screw Machine Co., Boston, Mass., has been incorporated with a capital of $100,000. Officers are: President, Orlando E. Patch, Concord, Mass.; treasurer, George V. Buehler, 1075 Boylston street, Boston; clerk, Willis F. Spear, 10 Grace street, Boston.

The Boston Iron & Metal Co., Cambridge, Mass., has been incorporated with a capital of $10,000. Officers are: George W. Butterick, Everett, Mass.; treasurer, George T. Strong, Malden, Mass., and clerk, George Code, Everett, Mass.

The Coffin Valve Co., Neponset, Mass., which is building a new machine shop with twice the capacity of the present plant, intends to install during the coming year a large num-

ber of machine tools, such as planers, lathes and boring machines.

Thomas F. Kelly, Galion, O., is organizing a company for the manufacture of a patent sheet steel vault for burial caskets. It is expected that a plant will be erected in Galion.

The Backmann Engineering Co., Youngstown, O., has been organized with a capital of $100,000, to manufacture standard and special machinery used in the manufacture of rubber goods.

The Kelly-Plough Gasoline Locomotive Co., Limited, has been incorporated with a capital of $80,000, to build and sell gasoline locomotives. The officers are: M. H. Kelly, president; F. T. Larrabee, vice president and E. E. Plough, secretary and treasurer.

The Scott & Sons Co., Medford, Mass., has been organized with a capital of $50,000, to manufacture automatic revolving chucks, collapsing taps, expanding dies and turret lathes. The officers are: Harry Dutton, president; Alexander MacGregor, treasurer, and Gordon Scott, clerk.

The General Equipment Co., Chicago, has been incorporated with a capital of $10,000, to manufacture machinery. Incorporators are: G. T. Ravenscroft, L. M. Ravenscroft and C. O. Estabrook.

The Buckeye Fence Machinery Co., Ashtabula, O., has been incorporated with a capital of $50,000. Incorporators are: G. W. Mooney, W. C. Grant, D. T. Parker, W. S. King and John Hubbard.

The National Marking Machine Co., Cincinnati, O., has been incorporated with a capital of $20,000. Incorporators are: Ethan B. Stanley, Chester W. Canine, Frank H. Shaffer, John W. Peck and Arthur Minot Peck.

The Barnhill Mfg. Co., Mineola, N. Y., has been incorporated with a capital of $100,000. Directors are: John D. Barnhill, S. Keith Evans, Brian Evans, James W. Barnhill and Reginald B. Douglass, of New York City. The company will manufacture and sell gates of all kinds.

The Charles P. Biggin Co., Philadelphia, Pa., is in the market for new machinery. It will probably purchase a medium weight double punch, four or five drill presses, emery grinder and buffer and the necessary pulleys and shafting.

The Clifton Nail & Supply Co., Boston and St. Louis, has been incorporated with a capital of $50,000. Officers are: President, John F. Scott, Franklin, Mass.; treasurer, Harry R. Scott, South Framingham, Mass.; clerk, Jasper N. Johnson, Somerville, Mass.

The Pearne-Krum Co., Chicago, has been incorporated with a capital of $10,000, to manufacture machinery. Incorporators are: Charles L. Krum, Daniel Peterkin and F. D. Pearne.

The N. B. Dodge Mfg. Co., Portland, Me., has been incorporated with a capital of $50,000. Officers are: President, Eugene L. Dodge, Fitchburg, Mass.; treasurer, B. F. Crowell, South Portland. The company will manufacture and deal in all kinds of machinery and mechanical tools.

Cooper Bros. Foundry Co., has been incorporated at Cortland, N. Y. with a capital of $50,000. Incorporators and directors for the first year are: George F. Cooper, Lester Cooper and C. H. Miller.

The Johnson Mfg. Co., Urbana, O., has been incorporated with a capital of $20,000 to engage in the manufacture of galvanized iron and tin ware. Incorporators are: J. B. Johnson, C. F. Johnson, B. L. Monday, A. W. Ritchie and F. H. Nanekirk.

The Thomas & Buckley Operating Co., New York, has been incorporated with a capital of $4,000, to manufacture machinery. Incorporators are: James J. Buckley, George S. Daso and H. J. Mier.

The Acid Proof Valve Co., Danville, Pa., has been incorporated under the laws of West Virginia with $100,000 capital. Morris Williams, Swarthmore, R. A. Quinn, Wilkesbarre, I. D. West, Danville, F. H. Kohlbracker, Nanticoke, and W. B. Reinhart, Shamokin, Pa., are the incorporators.

Fires and Accidents :—

David Wisser, 58 years old, was crushed to death in the Lehigh Foundry, Allentown, Pa., of which he was foreman. A tank weighing 13,000 pounds had been cast and Wisser went under it to release the blocks holding the 7,000 pound bottom plate. The plate was improperly fastened and it fell on him, crushing his life out instantly.

The "dry" at section 16 of the Oliver Iron Mining Co., Ishpeming, Mich., was destroyed by fire a few days ago with the changes of about 200 miners. Work has been begun on the erection of a new building, which will be 30 x 100 ft. and of more substantial construction than the building which was burned.

Fire in the Nelson building, Knoxville, Tenn., caused a loss of $8,000 to the Duncan Machinery Co., one of the tenants. Insurance, $5,000.

A "slip" at the Niles, O., furnace of the Carnegie Steel Co. resulted in the injury of six men and considerable damage to the plant. General Superintendent Barrett narrowly escaped being struck by a heavy steel bar which was suspended from the top of the furnace. Superintendent Wilkinson was struck by some of the material blown from the furnace and painfully, but not seriously injured.

The foundry and machine shop of Alpha W. Annis, Cherry Creek, N. Y., was destroyed by fire last week. The plant will be rebuilt.

New Construction :—

The American Car & Foundry Co. has broken ground at Berwick, Pa., for an addition 57x72 ft. to the wheel foundry, to be used for the molding of mine car wheels, increasing the output 40 wheels per day. A shed 75x200 ft. for the dismantling of cars for export shipment is also being put up.

The Kenton Iron & Steel Co., Mason City, W. Va., has let the contract for the erection of a plant 80x400 ft., frame, with corrugated sheet-iron roofing and siding. The daily capacity will be 40 tons of merchant iron and steel.

The Winslow Voting Machine Co. will build a plant at Marion, O., 60 ft. x 100 ft., three stories.

The Decatur Malleable Iron Works, Decatur, Ill., will rebuild the plant which was destroyed by fire several weeks ago. The walls of the old building wil lbe used, but in all places where it is possible to use steel construction to make the building fireproof, that will be done.

The Heindel Foundry Co., Hanover, Pa., recently organized, is erecting a building 50x100 ft. which it expects to have completed by Jan. 1. The company will manufacture iron, brass and other metal castings.

Friedley & Voshardt, Chicago, whose plant was recently visited by fire, which completely destroyed the ceiling stamping room, stock room and modeling room, are rapidly getting in shape again and expect very shortly to be in as good condition as ever. They will erect immediately an addition to their plant, 19 x 120 ft., and a 50 x 50 ell, all of fireproof construction.

The L. & I. J. White Co., manufacturer of knives and edge tools, Buffalo, N. Y., is building an addition 80x135 ft. to its forge department and will equip it with up to date machinery.

The Geiser Mfg. Co., Waynesboro, Pa., will build a new erecting shop 70x220 ft., blacksmith shop 70x102 ft. and two smaller buildings. At Greencastle, Pa., the company recently purchased a foundry 100x150 ft.

The Waukesha Expanded Metal Co., Waukesha, Wis., has increased its capital stock from $40,000 to $52,000, and will build a plant of brick, two stories and fireproof. It is expected that the plant will be in operation next spring.

The contract for the erection of new buildings and making improvements at the Southern railroad shops, at Prince-

ton, Ind., has been let. The estimated cost of the new construction is $35,000, not including equipment. There will be a new machine shop 90x232 ft. and several smaller buildings.

Satisfactory progress is being made on the Fort Worth Iron Works plant at Fort Worth, Tex. The building for the nut and bolt works is well under way and the stakes are set for the rolling mill. The company is now negotiating for the power machinery and hopes to be doing business within 90 days.

The Fulton Foundry & Machine Works, Atlanta, Ga., manufacturers of castings and special machinery, will erect two buildings each 120x300 ft., which will be equipped with modern machinery.

The Aultman & Taylor Machinery Co., Mansfield, O., is building a warehouse 111x191 ft. three stories, of steel, brick and tile, practically fireproof.

The Louden Machinery Co., Fairfield, Ia., has erected a fireproof warehouse and office building at St. Paul, Minn., 50x100 ft., two stories. This company's recently completed malleable iron plant at Fairfield is now in operation.

The Chicago Car & Locomotive Works, at Hegewisch, Ill., partly burned by an alleged incendiary fire October 9, will be rebuilt and operated. Advertisements for bids on rebuilding the burned portions have appeared under the name of F. M. Pease, who is understood to be managing the plant in payment of a loan of $200,000 made him by I. N. Perry before the company went into bankruptcy.

The work of installing the machinery in the Albany Forge plant, Albany, N. Y., is completed. It is expected that the plant will be ready for operation within two weeks. The plant is fitted out with the latest and most improved machinery and the accommodations for the workmen are of a superior kind.

The Bond Steel Post Co., Adrian, Mich., has completed a plant built of cement blocks 150 ft. long, 42 ft. wide, two stories. The lower floor is devoted to machine and post work and the second will be used for the present for storage purposes.

The Beall Non-Pounding Frog & Crossing Co., South Bend, Ind., will erect a plant for the manufacture of the Beall crossing frog and a line of railway supplies. The concern is capitalized at $500,000.

Langborn T. Anderson Jr. has bought the controlling interest in the Maysville Foundry Co., Maysville, Ky. The company will probably be capitalized at $50,000. The plant will be enlarged and new machinery installed.

The Robb-Mumford Boiler Co. has purchased ten acres in South Framingham, Mass, and will erect a steel and concrete building 150 x 300 ft., fitted up with electric cranes and all modern appliances.

The Waterloo, Cedar Falls & Northern railway will make extensive additions to its shops at Waterloo, Ia. The repairing of engines, which has heretofore been done at the Illinois Central shops, will be done at the company's enlarged plant.

General Industrial Notes:—

The iron foundry of N. N. Hill Co., East Hampton, Conn., is to be moved about the first of January to Cromwell, Conn., and incorporated with the general foundry of the J. & E. Stevens Co. Both companies are members of the National Novelty Corporation, manufacturer of iron toys.

S. R. Slaymaker of Lancaster, Pa., has bought the entire business, machinery, patterns, tools, etc., of the Thomas Slaight Lock & Mfg. Co., of Newark, N. J.

D. M. Glasgow and F. E. Denson have sold their interest in the Davenport Machinery Co., Davenport, Wash., to John Riley & Sons and F. H. Springer.

The Garry Iron & Steel Co., Cleveland, reports that it has received some very good orders recently in its crane department as well as for general machine work, and, judging from the numerous inquiries which it has received, believes that the coming year will be a good one.

The Davenport Locomotive Works, Davenport, Ia., has purchased from the Rockingham Building Co. the property on which its plant is located. The consideration was $650,000.

The Lenoir Car Works, Lenoir City, Tenn., will soon begin to make preparations to increase its capacity so that it can turn out ten cars per day after the first of the year. It is now manufacturing seven cars per day.

The Pennsylvania road is now prepared to build a locomotive for each working day at its shops at Altoona, Pa. Before the plant was enlarged, the company was turning out about 150 locomotives per year.

Robert Wetherill & Co., engine builders of Chester, Pa., have applied for a charter and will become an incorporated company.

The already large contract which the Pennsylvania Steel Co., Steelton, Pa., has for the erection of the Blackwell's Island bridge, New York, will be increased by nearly half a million dollars owing to changes which have been decided upon. There will be six instead of four railroad tracks and other important alterations will be made.

Street's Western Stable Car Line Co., Chicago, has begun to take orders for cars from outside companies. The capacity of the plant is now more than necessary to provide repairs and renewals for the company's own equipment.

The realty, plant and stock of the Elkhart Bridge Co., Elkhart, Ind., have been sold to the Elkhart Bridge & Iron Works.

The Cumberland River Estates have leased the Dover furnace to the Dover Iron Co., Bear Spring, Tenn., which is putting the plant in condition to be blown in May 1.

The Perkins Machine Co., Seattle, Wash., and the Challoner Machine Co., Oshkosh, Wis., have been consolidated. The Challoner Machine Co. has acquired a controlling interest in the Perkins company, which will be known as the Challoner-Perkins Co., and will manufacture its complete line of machinery in Seattle for the Pacific Coast trade. The Challoner company will operate the Oshkosh plant as heretofore, supplying the trade of the middle West, Eastern and Southern states. Each concern will be operated independently of the other.

The Indiana Rolling Mill Co., New Castle, Ind., manufacturer of shovels, spades, scoops and drain tools, advises us that it has not, as reported in the newspapers, taken over the disc department of the Chicago Steel Mfg. Co., whose plant at New Castle, Ind., was recently destroyed by fire. A new company is, however, being organized which will manufacture discs. The Chicago Steel Mfg. Co. is scrapping its plant.

The Avondale Stove & Foundry Co., Birmingham, Ala., recently placed in the hands of a receiver, on account of the disagreement of stockholders, has been purchased by Perkins Ellis, Thomas Ellis and Frank Ellis. Since the organization of the company, the plant has made a good record and has been a paying investment. It has an output of 200 stoves a day.

A number of men have been put to work at the Canton, O., plant of the American Sheet & Tin Plate Co. getting the machinery into shape for starting the mill the first week in January. About 300 men will be given employment after the first of the year.

Frank Jay Gould of New York, H. R. Wayt, E. D. Harned and Fritz Sitterding have been elected directors of the Old Dominion Iron & Nail Works at Richmond, Va. Frank Jay Gould was elected president with Thomas H. Wheelwright vice president and general manager.

The Cambria Steel Co., Johnstown, Pa., has secured an Australian contract calling for the shipment of about 1,500 tons of structural material to Adelaide for bridge work. Shipment will begin in January.

THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

The long awaited rainfall has come to the relief of the coke trade, to the blast furnaces threatened with a shut-down and to the railroads and manufacturing plants whose steam-making capacity was greatly reduced by bad water. For the present the drouth has been eliminated as a factor in pig iron production, but even with the increased number of coke ovens running or soon to be operated it will require time for the accumulation of coke stocks at furnaces, to give protection against the embargo to be expected in the winter season. The Connellsville output for the next few weeks promises to be at a record rate.

The week has brought no important transactions, but firmness characterizes the pig iron market in all centers. The East reports rather more activity than the West, one important consumer having bought foundry iron for shipment into the third quarter. Foundries have generally contracted for all the iron they will need in the first quarter and there may be an interval of quietness before business becomes active for later months. Those who have predicted some yielding in price after the rapid advance of November are watching narrowly for a nearer approach of production to consumption. Winter troubles with coke transportation are against any important change in the situation; but a number of additional furnaces are going in blast, so that progress is being made toward larger output. The United States Steel Corporation is not now considered likely to purchase Bessemer iron for January delivery, in view of its increased coke production and the blowing in of additional blast furnaces. No change in pig iron prices has been made apart from the Chicago district, where some producers are asking 50 cents a ton more. Southern production of pig iron is generally reduced at holiday time, and producers there have probably booked all the iron they can deliver in the next three months. Forge iron is conspicuous for the high prices recently brought and for its apparent scarcity. As high as $16 Northern furnace has been paid, this being the usual quotation in the Central West for No. 2 foundry.

The Pittsburg district reports comparatively little cessation of work at the mills for the holidays, and nearly all steel works enter the new year on a large scale of operations. Of the 242 tinplate mills of the American Sheet & Tin Plate Co. 220 will be active in the coming week and the conditions in this industry are further indicated by an advance of 10 cents a box made last week. Black sheets were advanced $2 a ton for box annealed and $1 for blue annealed, and on roofing advances of $1 and $2 have been made.

Considerable rail tonnage must yet be closed to bring the total of new business up to 1,000,000 tons by Jan. 1, which is the prediction recently made in some quarters. The Chicago & Northwestern purchase of 50,000 tons is reported this week, and in addition to 100,000 tons for the Michigan Central the Vanderbilt interests are reported to have taken thus far 126,000 tons. Other railroad buying keeps up well, additional bridge contracts being reported, including 5,000 tons for the C. H. & D., 12,000 tons for the New York Central and 6,000 tons for the D. L. & W. The Harriman lines have inquired for 14,000 tons, though their bridge orders for the past two years only amounted to 5,000 tons. Steel car contracts of the week were 2,000 for the Pittsburg Coal Co. and 1,000 for the P. & L. E., representing 30,000 tons of plates.

PITTSBURG.

OFFICE OF THE *Iron Trade Review*,
429 PARK BUILDING, Dec. 28.

The drouth which threatened to cripple completely the iron and steel plants throughout this district has at last been broken, and furnaces that were compelled to bank have resumed operation, while steel works whose output was greatly curtailed are again operating at their normal capacity. The rise in the rivers has also resulted in the shipment of a large tonnage of coal, much of which was consigned to steel plants in this vicinity. Only 4,500 ovens in the Connellsville region have been idle, but the majority of them will resume now that a water supply is insured. It is predicted that next week less than 2,000 ovens in the entire region will be idle, which will be a smaller idle capacity than at any time in recent years. Additional operative coke producing capacity will ease up the coke situation considerably, although the present coke consumption is greater than at any time in the history of the Connellsville industry, and it is doubtful if in the near future prices will be any lower than they are today. The rainfall has also relieved the railroads in putting an end to the crippling of locomotives by bad boiler water, and a large amount of accumulated freight has been moved this week.

Advances of $2 were announced in sheets and tin plate on Thursday, Dec. 22, by the leading interest, and the independents are also quoting on this higher basis. Advances of 5 cents on painted and 10 cents on corrugated roofing have also been made. At a meeting of the nut and bolt association held last week in New York an advance of 5 percent was made. The American Sheet & Tin Plate Co. this week is operating 220 of its 242 tin plate mills, while the operative sheet capacity remains the same as last week. Very few mills have taken advantage of the holiday season to shut down for repairs, the Shenango steel plant of the Carnegie Steel Co., New Castle, Pa., being the only steel plant that is off this week.

The market has been comparatively quiet during the week and it is doubtful if there will be any considerable buying until after the new year. Locally the largest order, that will result in the production of 20,000 tons of plates, was placed by the Pittsburg Coal Co. with the Standard Steel Car Co. The contract calls for 2,000 steel cars. The pig iron market remained practically stationary as no large buyers have appeared with requirements that would result in higher quotations. It is now practically certain that the United States Steel Corporation will not buy Bessemer for January delivery, as the large number of furnaces in operation will produce sufficient iron for all requirements. Bessemer is held on the basis of $16 to $16.25 at the furnace for either prompt or future delivery, while No. 2 is quoted at $17.35 to $17.85 Pittsburg. Forge iron continues scarce and is quoted at $16.50 to $16.85 Pittsburg. Very little Southern iron is being sold in this market at present, although the delivered prices are now almost on a parity with those of Northern iron. Southern forge is quoted at $12.75, making a Pittsburg delivered price of $17.10, while No. 2 is quoted at $17.85 to $18.10 Pittsburg.

Pig Iron.—A number of idle stacks in this and the Valley districts that were banked last week have resumed owing to the fall of rain, and pig iron production will materially increase. Whether this will result in an easier market is extremely doubtful, inasmuch as nearly all of the furnaces are behind on deliveries and they will now have an opportunity of catching up. Coke shipments have improved and the furnaces are having shipments brought forward as rapidly as possible in order to accumulate stocks before the extreme cold weather sets in again. Sales of iron during the week have been limited to small lots entirely and quotations remain practically unchanged. A large number of foundries in this district have not covered their requirements for the first half of next year and it is expected that they will appear in the market shortly after the first of the year. We revise quotations as follows:

Bessemer, Valley	$16 00 to 16 25
Bessemer, Pittsburg	16 85 to 17 10
No. 1 Foundry	18 00 to 18 25
No. 2 Foundry	17 35 to 17 85
Gray Forge, Pittsburg	16 50 to 16 85
Basic, Valley	15 75 to 16 00
Basic, Pittsburg	16 60 to 16 85

Steel.—Premiums ranging from $2 to $2.50 a ton are now being asked on billets and sheet bars, none of the producers quoting the agreed prices for any delivery. Most of the mills are unable to promise delivery in the next two months at any price, while two large independent producers will not quote on business for delivery after March. Agreed prices are as follows: Bessemer and open-hearth billets, 4 x 4 in., and slabs, up to and including 0.25 carbon, $21, f. o. b. mill, Pittsburg, with actual freight to points of delivery; 0.26 and including 0.60 carbon, $1 advance, 0.61 to 1.00 carbon, $2 advance. Billets smaller than 4 x 4 in., $2 advance; sheet and tin bars, $23; cut bars, $23.50; forging billets, $23. Bessemer and open-hearth steel rods are held at $30.50 to $31.

Ferro-Manganese.—The consumption of ferro is very heavy and the leading producer is not anxious to sell at the prevailing price. We quote domestic ferro, 80 percent, at $46, delivered in carload lots at buyer's mill, any point east of the Mississippi.

Muck Bar.—Owing to the advancing forge iron market, muck iron continues to advance. Neutral bars are held at $28.85, Pittsburg.

Skelp.—Skelp continues to advance and we quote grooved iron at 1.45c to 1.50c, Pittsburg, and sheared at 1.55c to 1.60c. Grooved iron is held at 1.70c to 1.75c, and sheared at 1.80c to 1.85c.

Rails and Track Material.—Predictions continue to be made that the rail mills will have orders on their books by the end of the week for next year's delivery amounting to 1,000,000 tons. Thus far the orders actually closed amount to about 600,000 tons. We quote: Fifty lb. and over, 500 tons, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 16-lb., $25; 20 lb., $24; 25 to 45 lb., $23. Angle bars, 1.25c; spikes, 1.65c to 1.70c.

Plates.—The Pittsburg Coal Co. last week placed an order with the Standard Steel Car Co. for 2,000 steel cars. To fill this order 20,000 tons of plates will be required. Specifications from steel car plants are unusually heavy and with the large number of cars already booked the outlook is unusually bright. We make the following quotations: Tank plates, ¼ in. thick, 6¼ to 14 in., inclusive, 1.40c f. o. b. mill Pittsburg; over 14 in. up to 100 in., 1.50c. Extras are as follows per lb.: Flange and boiler steel, 10c; marine, A. B. M. A., and ordinary fire box, 20c; still bottom, 30c; locomotive fire box, 50c; plates over 100 in. up to 110 in width, not less than 5c per 100 lb. extra; plates 110 in. to 115 in. wide, not less than 10c extra; 115 to 120 in., 15c extra; plates 120 in. to 125 in. wide, not less than 25c extra; plates, 125 in. to 130 in., not less than 50c extra; plates 130 in. wide, not less than $1 extra; plates 3-16 in. thick, $2 extra; gauges 7 and 8, $3 extra; No. 9, $5 extra. Five cents extra for less than carloads. Terms net cash in 30 days, and for all points of delivery in the United States except the Pacific Coast.

Structural Material.—It is intimated in the trade that the structural material for the Boston Elevated will be furnished the Ft. Pitt Bridge Co. by the Lackawanna Steel Co. below pool prices. It is reported that an option was given this concern on the required amount of structural steel last summer and that this price holds good now that the contract has been awarded the local erecting company. The material will be shipped here from Buffalo for fabrication and thence to Boston for erection. Despite the heavy freight charges that will be thus incurred, the contract price of the local erecting company was considerably below that of any of its competitors. We quote as follows: Beams and channels up to 15 in., 1.50c; over 15 in., 1.60c; angles, 3 x 2 up to 6 x 6, 1.50c; zees, 1.40c; tees, 1.55c; angles from 3 to 16 in., 1.50c; universal and sheared plates, 6¼ to 14 in., inclusive, 1.40c; over 14 in., 1.50c base.

Bars.—Bar iron is now on the basis of 1.65c Youngstown, or 1.69¾c Pittsburg. Even at these prices mills are not anxious to book business for future delivery, and despite the $6 a ton difference between iron and steel bars, the iron mills are having no trouble in securing sufficient business to insure full operation. We make the following quotations: Bar iron, 1.65c to 1.69¾c Pittsburg; hoops, 1.55c, and bands, 1.40c, both taking bar extras. Bessemer steel bars, 1.40c; open-hearth steel bars, 1.40c; plow and cultivator beams, 1.40c, net; channels, angles, zees and tees, under 3 in., 1.50c. The following differentials are maintained on steel: Less than 2,000 lb. of a size and not less than 1,000 lb., 10 cents advance; less than 1,000 lb. of a size, 30 cents advance.

Pipes and Tubes.—The contract for 20,000 tons of line pipe has not yet been let by the Ohio Fuel Supply Co., although it may be closed any day. Demand for merchant pipe and boiler tubing continues heavy. Discounts to consumers, carload lots, f. o. b. Pittsburg, plus freight to destination according to Tube Rate Book, are as follows:

MERCHANT PIPE.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch	69	53	67	51
⅜ to 6 inches	77	67	75½	65½
⅞ and ½ inch	73	61	71	59
7 to 12 inches	73	57	70½	55

Extra Strong Plain Ends.

⅛ to ¾ inch	62	50	60	48
½ to 4 inches	69	57	67	55
4½ to 8 inches	65	53	63	51
Double extra strong plain ends, ¼ to 8 inches	58	47	56	45

MERCHANT BOILER TUBES, LESS CARLOADS, 22 FEET AND UNDER.

	Steel.	Iron.
1 to 1¼ inches	46	43
1¼ to 2¼ inches	58	43
2½ inches	60	48
2¾ to 5 inches	66	55
6 to 13 inches	58	43

Sheets.—On Thursday, Dec. 22, the American Sheet & Tin Plate Co. announced an advance of $2 on black sheets. Galvanized sheets were not changed as prices were only recently advanced in that line. Advances on corrugated roofing, amounting to 5 cents on painted and 10 cents on galvanized, were also announced. We revise quotations on black sheets in carload lots as follows: No. 30, 2.70c; No. 29, 2.60c; No. 28, 2.30c; No. 27, 2.20c; Nos. 25-26, 2.15c; Nos. 23-24, 2.10c; Nos. 18-20, 2.05c; No. 16, 2c; Nos. 12-14, 1.95c; No. 9, 1.90c; No. 8, 1.85c. Galvanized: No. 30, 4.25c; No. 29, 3.75c; No. 28, 3.35c; No. 27, 3.15c; Nos. 25-26, 2.95c; Nos. 23-24, 2.75c; Nos. 18-20, 2.60c; No. 16, 2.45c.

Tin Plate.—Tin plate was advanced 10 cents a box on Thursday, Dec. 22, going into effect immediately. We quote 100-lb. coke plates at $3.55 or $3.50, net per box, f. o. b. mill Pittsburg. The net price is now almost invariably quoted, the rebate plan no longer being in vogue.

Wire and Wire Nails.—Demand for wire products continues heavy and an advance in prices is looked for next week. Manufacturers of cut nails report an active market. We make the following quotations: Wire nails, jobbers' carload lots, $1.75; retailers' carloads, $1.80; and less than carloads, $1.90; painted barb wire, $1.90 to jobbers in carloads; retailers' carloads $1.95 and less than carloads, $2.05, with 30 cents for galvanizing. Annealed smooth fence wire is held at $1.60, with the usual differentials to retailers for carloads and less than carloads. Quotations are all f. o. b. Pittsburg, 60 days, with 2 percent discount for cash in ten days. Iron cut nails are held at $1.85 Pittsburg, and steel at $1.75.

Merchant Steel.—Demand for merchant steel continues heavy and the mills in this district are all working in full. Demand for shafting is improving, the orders from the South being unusually heavy. We make the following quotations: Cold rolled and ground shafting, 52 percent off in carload lots, and 47 off in less than car lots, delivered in base territory; tire steel, 1.60c to 1.65c; open hearth spring steel, 2c to 2.10c; sleigh shoe, flat, 1.55c to 1.60c; smooth finished machinery steel, 1.60c; toe calk, 1.95c to 2c.

Old Material.—Little material is moving and quotations remain practically unchanged. Last week considerable low phosphorus material was purchased by the steel casting plants in this vicinity at a price slightly under $20. We make the following quotations, gross tons: Heavy melting stock, $16.50 to $17; low phosphorus stock, $20 to $20.50; No. 1 cast scrap, $15 to $15.50; cast iron borings, $10.50 to $11; No. 1 wrought, $17.50 to $18, net tons; rerolling rails, $16.50 to $17.

Coke.—Now that the water supply in the Connellsville coke region has been replenished additional ovens are being fired and the indications are that not more than 2,000 ovens will be idle the first of the year. The movement of coke from the ovens has been unusually heavy in the last few days and blast furnaces are endeavoring to accumulate stocks as long as shipments remain unhampered. Furnace coke for delivery the first half of next year has been selling at $2.40, while foundry is held at $2.75 to $3. During the week ending Dec. 17, the production of the upper region amounted to 232,889 tons, while the lower region produced 68,878 tons. In the two regions less than 4,500 ovens were idle.

CHICAGO.

Office of *The Iron Trade Review*,
1164 Monadnock Block, Dec. 27.

Following the advances in plates, steel bars and structural shapes of $2 a ton each, announced last week, the American Sheet Steel & Tin Plate Co. advanced its prices $2 a ton on tin plate, $2 a ton on box annealed and $1 a ton on blue annealed sheets. Galvanized was not changed, the report to the contrary being an error. Billets, while remaining nominally at $24 Chicago for rerolling and $26 for forging, are selling at prices from $1 to $3 above these figures, the market being an open one on this product. Orders for standard sections are slow in coming forward, the week's tonnage being of comparatively small proportions. The Christmas holidays have, in fact, greatly interfered with the sales of all iron and steel products, and until after the new year is passed no marked improvement is anticipated. Specifications, however, have been in good volume, mills and furnaces receiving all the tonnage in this respect they can comfortably handle.

Pig Iron.—The holiday lethargy still holds the market in its grasp. Demand for pig iron in the week under review has been quiet, orders booked being largely for carload lots up to 100 tons. The market, however, is very firm and higher prices are looked for on the standard grades after the first of the year is passed. One local furnace has advanced its prices 50 cents a ton, and its minimum for No. 2 foundry is now $17.50 Chicago. Other Northern interests, however, are holding their product at $17 and are taking business at this figure. Lake Superior charcoal is very strong, and prices have advanced to a minimum of $18.25 Chicago. Southern silveries are also scarce, prices having been advanced during the week $2 a ton on grades running 6 to 10 percent silicon. Basic iron is another product which is scarce and on which prices are advancing, this iron being now quoted $18.15 Chicago. There has been some inquiry for malleable iron but no tonnage of any consequence has been placed. We have revised our prices, and quote as follows:

Lake Superior Charcoal	$18 25 to 18 75
Northern Foundry No. 1	17 50 to 18 00
Northern Foundry No. 2	17 00 to 17 50
Northern Foundry No. 3	16 50 to 17 00
Northern Scotch Foundry	17 50
Ohio Strong Softeners No. 1	19 30 to 19 80
Ohio Strong Softeners No. 2	18 30 to 18 80
Southern Foundry No. 1	17 65
Southern Foundry No. 2	17 15
Southern Foundry No. 3	16 65
Southern Foundry No. 4	16 40
Southern No. 1 Soft	17 65
Southern No. 2 Soft	17 15
Southern Gray Forge	16 15
Southern Mottled	16 15
Southern Silveries (4% to 6% Silicon)	18 15 to 18 65
Jackson Co. Silveries (6% to 8% Silicon)	21 30 to 21 80
Jackson Co. Silveries (8% to 10% Silicon)	22 30 to 22 80
Alabama and Georgia Car Wheel	20 15
Malleable Bessemer	17 50
Basic Iron	18 15

Billets.—Sales in this market in the current week have been limited to axle and forging billets, for which there is a fair demand. Prices are very strong, premiums of $1 to $3 a ton above the "official" schedule being asked in every instance. Although they are not being lived up to, we quote association prices with the foregoing reservation, on carload lots, Chicago deliveries: Forging billets, 4 x 4 and larger, up to but not including 10 x 10, up to .25 carbon, $26; up to and including .60 carbon, $1 extra; rerolling billets, Bessemer or open-hearth, 4 x 4 and larger, $24; billets, 3⅞ in. and smaller, and sheet and tin bars, $26. Wire rods, $30 Pittsburg.

Bars.—The week's business in both iron and steel bars has been confined practically to specifications against old orders, the aggregate tonnage of which is very large.

The $2 advance on Bessemer and $1 on open-hearth bars, which again puts both products on the same basis, has been well received by the trade, it having been expected for some weeks. Bar iron is without change as to price. We have revised our quotations and quote carload lots, mill shipments, Chicago delivery, as follows: Bar iron, 1.65c to 1.70c; Bessemer and open-hearth bars and bands, 1.56½c base, half extras; soft steel angles, less than 3 x 3, 1.76½c; hard steel angles, 1.50c to 1.65c; hoops, 1.71½c base, full extras. Store quotations are strong, and we quote on lots from warehouse stocks, as follows: Bar iron, 1.90c to 2c base, full extras; soft steel bars and bands, 1.75c to 1.85c base half extras; soft steel angles, chanels and tees, 1.85c to 1.95c; hoops, 2c to 2.10c base full extras.

Sheets.—The leading producer has made an advance of $2 a ton on tin plate, $2 a ton on box annealed and $1 a ton on blue annealed black sheets, the same going into effect last week. Galvanized is without change. The demand for both black and galvanized is very heavy and quotations are well sustained. We have revised our prices and quote carload lots, mill shipments, Chicago delivery, as follows: Blue annealed sheets, Nos. 9 and 10, 1.81½c to 1.86½c; Nos. 11 and 12, 1.86½c to 1.91½c; Nos. 13 and 14, 1.91½c to 1.96½c; Nos. 15 and 16, 2.01½c to 2.06½c. On box annealed, one pass, cold rolled, we quote Nos. 18 and 20, 2.21½c to 2.26½c; Nos. 22 and 24, 2.26½c to 2.31½c; Nos. 25 and 26, 2.31½c to 2.36½c; No. 27 2.36½c to 2.41½c; No. 28, 2.46½c to 2.51½c; No. 29, 2.56½c to 2.61½c; No. 30, 2.66½c to 2.71½c. Jobbers' prices have also been advanced proportionately with the advance on mill shipments. We quote on lots from warehouse stocks as follows: No. 10, 2c to 2.05c; No. 12, 2.05c to 2.10c; No. 14, 2.10c to 2.15c; No. 16, 2.20c to 2.25c; No. 18, 2.40c to 2.45c; No. 20, 2.45c to 2.50c; No. 22, 2.50c to 2.55c; No 24, 2.55c to 2.60c; No. 26, 2.60c to 2.65c; No. 27, 2.70c to 2.75c; No. 28, 2.80c to 2.85c; No. 29, 2.90c to 2.95c. Galvanized sheets, mill shipments, Chicago delivery, are quoted without change as follows: Nos. 12-14, 2.46½c; No. 16, 2.61½c; Nos. 18-21, 2.76½c; Nos. 22-24, 2.91½c; No. 26, 3.11½c; No. 27, 3.31½c; No. 28, 3.51½c. Jobbers' prices have been advanced $2 a ton, and we revise our store prices as follows: Nos. 10 to 16 inclusive, 2.80c to 2.90c; Nos. 18 and 20, 2.90c to 3c; Nos. 22 and 24, 3.10c to 3.20c; No. 26, 3.30c to 3.40c; No. 27, 3.50c to 3.60c; No. 28, 3.70c to 3.80c; No. 29, 4.15c to 4.25c; No. 30, 4.60c to 4.70c.

Structural Steel.—Specifications continue to come forward in ample form, mills reporting no lack of tonnage in this respect. The $2 advance which went into effect last week has stiffened the market considerably and resulted in an increase in specifications. Little new business is booked as most of the local consumers are under contract. We have revised our prices, and quote Chicago delivery, mill shipments, as follows: Beams and channels, 3 to 15 in. inclusive, 1.66½c; angles, 3 to 6 in., ¼ in. and heavier, 1.66½c; angles, larger than 6 in. on one or both legs, 1.76½c; beams larger than 15 in., 1.76½c; zees, 3 in. and over, 1.66½c; tees, 3 in. and over, 1.76½c, with the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. Store prices have been advanced, and, according to tonnage, are quoted: 1.95c to 2.10c for angles, beams and channels, base sizes, with 2.05c to 2.15c for 18, 20 and 24-in. beams; tees and zees, 2c to 2.10c. These prices are for either random lengths or cut to specifications.

Plates.—Since the recent advance there has been a brisk demand both from mills and local warehouses. Specifications have also shown an improvement, both factors being well supplied in this respect. We have revised our prices, and now quote carload lots, mill shipments, Chicago delivery, as follows: Tank steel, ¼ in. and heavier, 6¼ in. to 14 in. wide, rectangular plates only, 1.56½c base; over 14 in. to 100 in., 1.66½c base; flange steel, 1.76½c base; marine steel, 1.86½c base, all full extras. Plates, 3-16 in. thick, $2 extra; gauges 7 to 8, $3 extra; No. 9, $5 extra. Less than carload lots, $5 extra. Store prices are very firm. We have revised our quotations as follows: Tank steel, ¼ in. and heavier, up to 100 in. wide, 1.90c to 2c; 3-16 in. up to 72 in., 2c to 2.10c; No. 8, up to 60 in. wide and No. 10 up to 48 in. wide, 2c to 2.10c. Extras ranging from 10c to 25c are charged for wider widths; flange steel, 25c extra.

Rails and Track Supplies.—New business placed with western rail mills has not been of heavy proportions in the week under review, the quietness being attributed to the intervention of the holiday season. Light rails and track supplies, however, continue to sell freely and in large tonnages. Prices are without change, and we quote heavy sections in 500-ton lots and over, f. o. b. mill, $28; less than 500 tons to carload lots, $30; less than carload lots, $32. Light rails are as follows: 12 lb. sections, $26; 16 lb., $25; 20 and 25 lb., $24; 30, 35, 40 and 45 lb. sections, $23, all f. o. b. Milwaukee mill. Track supplies f. o. b. Joliet mill: Angle bars, 1.30c to 1.35c; spikes, first quality, 1.70c to 1.75c; track bolts, 3¼ x ¾, with square nuts, 2.30c to 2.40c per 100 lbs., with hexagon nuts, 2.45c to 2.55c.

Merchant Steel.—Mills are booking little new tonnage for the reason that most of them have their order books full and are practically out of the market. We have revised our prices in accordance with the advance in steel bars, and quote mill shipments, Chicago delivery, carload lots, as follows: Spring steel, 2c; sleigh shoe, flat sizes, 1.61½c; concave and convex, 1.76½c; cutter shoe, 2.25c; smooth finished machinery steel, 1.81½c; smooth finished tire, 1.76½c; plow steel, 2.20c and upwards, according to quality; toe calk steel, 2.11½c. Crucible tool steel, 6½c to 8c; special grades of tool steel, 13c and upwards. Cold rolled shafting, old prices of which were reaffirmed at the recent meting, we continue to quote at 52 percent from list on carload lots, and 47 percent discount on less than carload lots.

Merchant Pipe.—There is a good demand, specifications, particularly being in excellent volume. Prices are without change, and we quote carload lots, mill shipments, random lengths, f. o. b. Chicago, as follows:

MERCHANT PIPE.

	Steel Pipe.		Guaranteed Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ and ¼ inches	67.35	51.35	65.35	49.35
⅜ and ½ inches	71.35	59.35	69.35	57.35
¾ to 6 inches	75.35	65.35	73.85	63.85
7 to 12 inches	70.35	55.35	68.85	53.35

Boiler Tubes.—The market is without material change, mills and jobbers reporting that both specifications and new contracts are of good volume. We quote mill shipments, carload lots, Chicago deliveries as follows:

BOILER TUBES.

	L. W. Steel Percent.	C. C. Iron. Percent.	Seamless Steel. Percent.
1 to 1½ inch	44.35	41.35	52.35
1¾ to 2¼ inch	56.35	41.35	40.35
2½ inch	58.35	46.35	43.35
2¾ inch to 5 inch	64.35	53.35	Up to 4 inches 50.85
6 to 12 inch	56.35	41.35	

The following are the agreed discounts from store:

	Steel.	Iron.	Seamless Steel.
1 to 1½ inches, inclusive	40½	37½	40
1¾ to 2¼ inches, inclusive	50½	35	37½
2½ inches, inclusive	53	37½	40
2¾ to 5 inches, inclusive	60½	47½	47½
6 inches and larger	50½	35	

Cast Iron Pipe.—New demand is of quiet proportions, this being the unseasonable period of the year for purchasing cast iron pipe. Prices are firm, and we quote carload lots, Chicago delivery, as follows: 4-in. water pipe, $28.50; 6-in. and larger, $27.50; gas pipe, $1 a ton higher.

Wire Products.—The excellent demand which has been felt for several weeks continues undiminished. All branches of the wire trade are specifying full quotas against their contracts, and the entire output of Western mills goes into immediate consumption. Prices are firm. We quote carload lots, mill shipments, Chicago delivery, as follows: Wire nails, $1.90; painted barb wire, $2.05; galvanized barb wire $2.35; smooth annealed wire, $1.75; smooth galvanized wire, $2.05; polished staples, $2; galvanized staples, $2.30. Less than carload lots to jobbers are 5 cents higher than above prices. The retail trade is quoted 5 cents extra over the foregoing on carload lots, and 10 cents extra on less than carload lots. Bale ties are unchanged at 82½ and 5 percent to 85 percent discount f. o. b. Waukegan, Ill., on straight carload lots. Poultry netting, 85 and 5 percent discount from list f. o. b. Joliet and DeKalb, with actual freight allowed not exceeding 30 cents per 100 lbs.

Foundry Coke.—The scarcity of coke continues to grow, and prices in the local market are very firm. Sales in the past week have been on the basis of $5.50 Chicago for standard 72-hour Connellsville brands, or $2.85 to $2.95 at the ovens. Wise County (Va.) coke is quoted $3 at the ovens, or $5.25 Chicago.

Old Material.—As with other products, old material has felt the holiday dullness and little tonnage has been moved in the week under review. Quotations are substantially the same, and we quote dealers' selling prices, gross tons, as follows:

Old steel rails (4 feet and over)	$16 00 to 16 50
Old steel rails (less than 4 feet)	15 00 to 15 50
Old iron rails	21 00 to 22 00
Relaying rails, subject to inspection	22 00 to 22 50
Relaying rails, without inspection	20 00 to 20 50
Old wheels	16 00 to 16 50
Heavy melting steel	13 50 to 14 00
Mixed country steel	9 75 to 10 25
Low phosphorus scrap (.05 and under)	14 00 to 14 50

The following quotations are for net tons:

No. 1 R. R. wrought	17 00 to 17 50
No. 2 R. R. wrought	16 00 to 16 50
Shafting	17 00 to 17 50
Dealers' Forge, No. 1	14 00 to 14 50
Wrought pipe and flues	13 00 to 13 50
No. 1 cast, 150 lb. and less	13 00 to 14 00
No. 1 mill	11 00 to 11 50
No. 1 Busheling	12 50 to 13 00
No. 2 Busheling	11 00 to 11 50
Country sheet	8 00 to 8 50
No. 1 boilers, cut	11 50 to 12 00
Boiler punchings	13 50 to 14 00
Iron car axles	21 50 to 22 50
Steel car axles	17 00 to 17 50
Iron axle turnings	11 50 to 12 00
Steel axle turnings	11 50 to 12 00
Cast borings	8 00 to 8 50
Mixed borings, etc.	8 00 to 8 50
Machine shop turnings	11 00 to 11 50
Railroad malleable	13 00 to 13 50
Agricultural malleable	12 50 to 13 00
Stove plate and light cast scrap	12 50 to 13 00
Old iron splice bars	18 50 to 19 00

CLEVELAND

OFFICE OF THE *Iron Trade Review*, 1064 ROSE BUILDING, Dec. 28.

The melting of the snow and the heavy rainfall of the past few days were most welcome to the industries of the Central West. The atmospheric changes came at a time when another week of drouth would have paralyzed many industries. Some railroads had already served notice that they would not be able to give any guaranty as to delivery of freight, as they were compelled to haul water long distances to supply their engines.

Throughout the trade this week there is the quiet always expected between Christmas and New Year's, but nowhere is there any indication of weakness.

Iron Ore.—The statistics of receipts of ore at Lake Erie ports and of ore on dock Dec. 1, published elsewhere in this issue, are regarded as favorable. It is expected that during the winter months the movement from docks will be heavy and that the amount of ore on dock at the opening of navigation will be smaller than for a number of years. The fact that Cleveland ranks third this year in ore receipts is due in part to the reduced consumption of the Central furnaces, two of which have been rebuilt and have been out of service about six months. One of these stacks is now nearly ready to be blown in and the other will be about Feb. 1, and it is expected that both furnaces will be in operation throughout 1905. Improvements to the docks at the Central plant will greatly facilitate the handling of ore.

Considerable inquiry is developing among buyers who are anxious to sound the market, but sellers, as a rule, are not ready to quote and sales are few. It is not anticipated that there will be much activity for a few weeks.

Pig Iron.—The quiet reported last week continues and prices are practically stationary, but the evidence that many furnaces are pretty well sold up for the first half of 1905 is accumulating and the market is strong. Charcoal iron is in better demand. No. 2 foundry sells at $16 to $16.50, Valley, and in some cases as high as $17. Basic and Bessemer continue strong at $16 to $16.25. Little is being done with Southern iron in this locality. The price ranges from $13.50 to $14 for No. 2, Birmingham. We quote as follows, Cleveland delivery:

Bessemer	$16 85 to 17 10
No. 1 Foundry	16 75 to 17 25
No. 2 Foundry	16 50 to 16 90
No. 3 Foundry	15 75 to 16 00
No. 2 Southern	17 35 to 17 85
Gray Forge	16 60 to 16 85
Gray Forge, Southern	16 00 to 16 60
Lake Superior charcoal	17 50 to 18 00

Coke.—The rainfall in the Connellsville region has relieved the situation and there is no longer danger of inadequate water supply. Prices have not changed, furnace coke being quoted at $2.50 and foundry at $2.75.

Finished Material.—The new prices on plates, shapes and bars announced last week were expected and have had little effect. As buying was heavy just before the advances were made, there is naturally something like a lull now, but the mills are busy and prospects are excellent. Some sales of steel bars have been made at the new price, 1.49½c Cleveland, for Bessemer and open-hearth, but consumers, for the most part, did their buying before the new prices became effective. The manufacturers of bolts and nuts have advanced prices 5 percent and state that business prospects have improved. Billets are selling at premiums of $2 to $3 above the official price, $21. Prices of black sheets have advanced $2 per ton. The prices of the principal producers through jobbers are as follows: Cleveland delivery, the freight from Pittsburg being 9½ cents: Mill sales of black sheets in car load lots, No. 10, 1.79½c; No. 11-12, 1.84½; No. 14, 1.89½c; No. 16, 1.99½c; No. 27, 2.34½c; No. 28, 2.44½c. Galvanized mill sales: No. 14, 2.49½; No. 16, 2.59½; No. 18-20, 2.73½; No. 22-24, 2.89½; No. 25, 3.09½; No. 27, 3.29½; No. 28, 3.49½. Out of stock, black sheets ¼ in., 1.80c; 3-16 in., 1.09c. Blue annealed, No. 10, 2c; No. 12, 2.05c; No. 14, 2.10c; No. 16, 2.20c. One pass cold rolled: No. 18-20, 2.35c; No. 22-24, 2.40c; No. 26, 2.45c; No. 27, 2.50c; No. 28, 2.60c; No 30, 3c. Galvanized out of stock: No. 16, 2.85c; No. 18-20, 2.95c; No. 22-24, 3.10c; No. 26, 3.30c; No. 27, 3.50c; No. 28, 3.70c; No. 30, 3.50c.

Old Material.—A large amount of scrap has recently been shipped into Cleveland, causing an oversupply of mill material, and concessions have occasionally been made, but prices, as a rule, are firm and about the same as for the past two weeks. We quote as follows, gross tons, Cleveland:

Old iron rails	$20 00 to 21 00
Old steel rails (over 6 feet)	15 50 to 16 50
Old steel rails (under 6 feet)	15 00 to 16 00
Old car wheels	15 50 to 16 00
Steel boiler plate	10 00 to 11 00
Steel axles	17 00 to 18 00
Malleable iron (railroad)	15 00 to 15 50
Malleable iron (agricultural)	14 50 to 15 00
Heavy steel	15 00 to 15 50

We quote as follows, net tons:

No. 1 R. R. wrought	17 00 to 17 50
No. 1 busheling	14 50 to 15 00
No. 1 machine cast	14 50 to 15 00
Iron axles	19 00 to 20 00
Axle turnings	12 50 to 13 00
Wrought turnings (free from cast)	10 50 to 11 00
Grate bars	10 00 to 10 50
Pipes and flues	13 00 to 14 00
Tank iron	10 00 to 10 50
Hoop and band iron	8 00 to 9 00
Sheet iron	6 50 to 7 50
Wrought drillings	10 00 to 11 00
Stove plate	11 00 to 11 50
Cast borings	8 00 to 8 50

CINCINNATI.

Dec. 27.

The coke market continues firm and offerings restricted. Furnace coke is quoted at $2.25 on contract and foundry coke at $2.60 to $2.75 f. o. b. ovens.

Pig Iron.—Business during the week has been somewhat interfered with by the holidays and there has been little change in the situation. In Southern iron $13.50 for No. 2 foundry, Birmingham, is well established and a sale of 3,500 tons of No. 3 and No. 4 gray forge is reported on this basis. Gray forge continues firm and $12.50 Birmingham is probably the inside figure for this grade. In Northern irons No. 2 foundry is firm at $16 furnace. It is believed in the trade that consumers are fairly well supplied for the first quarter and that Southern furnaces are pretty well sold up for this period, so that trading from now on will be largely for delivery over the second quarter. It is the sentiment also of the trade that should buyers defer placing contracts for their second quarter wants the situation and the disposition of the furnace interests are such that prices will not be affected by the dullness which would result from such holding off by consumers. Reports from traveling men for the pig iron agencies indicate increased consumption, which is also borne out by the manner in which the consumers are taking iron on contracts and calling for deliveries. A few instances are noted, however, of consumers requesting that shipments be deferred—attributed to the approach of the stock taking period. Quotations f. o. b. Cincinnati are as follows:

Southern Foundry No. 1	$16 75 to 17 00
Southern Foundry No. 2	16 25 to 16 50
Southern Foundry No. 3	15 75 to 16 00
Southern Foundry No. 4	15 50 to 15 75
Southern Foundry No. 1, soft	16 75 to 17 00
Southern Foundry No. 2, soft	16 25 to 16 50
Gray Forge	15 25 to 15 50
Northern Foundry No. 1	17 65
Northern Foundry No. 2	17 15
Southern Charcoal	18 75 to 19 00

Finished Material.—The market continues firm and the advances of a week ago have not restricted buying. Specifications are coming in for fair quantities and there is a feeling that the undertone to the market is good. Bar iron is quoted at 1.65c; steel bars at 1.53c, half extras, with dealers quoting 1.85c for iron and steel out of store. Galvanized sheets at 75 and 10 and 5 percent off. We quote black sheets, No. 27, at 2.40c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.70c; No. 27, 2.60c; No. 16, 2.20c; No. 14, 2.10c; No. 12, 2.05c; No. 10, 2c. Tank plates are firm and sell out of stores at 1.95c for ¼-in. and 2.05c for 3-16 No. 8 and No. 10. Beams and channels are quoted at 1.95c from stock, and angles at 1.95c to 2c for base sizes.

In merchant pipe trade continues fair and the anticipated advance in quotations has not yet been announced by the leading interests, but it is expected that the schedule will be changed by or shortly after the first of the year. Carload lots are quoted as follows f. o. b. Cincinnati:

MERCHANT PIPE.
(Basing Discounts.)

	Steel Pipe.		Guaranteed Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ and ¼ inches	67.35	51.35	65.35	49.35
⅜ and ½ inches	71.35	59.35	69.35	57.35
¾ to 6 inches	75.35	65.35	73.85	63.85
7 to 12 inches	70.35	55.35	68.85	53.35

Old Material.—Consumers are declining to meet sellers' views, so that the movement is light, but everything on the list is firmly held, with quotations as follows:

Old No. 1 railroad wrought, net tons	$15 00 to 15 50
Cast machine and foundry, net tons	13 50 to 14 00
Old iron rails, gross tons	19 00 to 20 00
Old steel rails, gross tons	14 00 to 15 00
Old short lengths, gross tons	14 50 to 15 00
Old iron axles, net tons	19 00 to 20 00
Stove plate, net tons	9 50 to 10 00
Wrought turnings, net tons	10 00 to 10 50
Cast borings, net tons	9 00 to 9 50

NEW YORK.

OFFICE OF THE *Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., Dec. 27.

Pig Iron.—Although broken by holidays, the past week has seen an active market in this vicinity. Sales made aggregate about 30,000 tons, the majority being foundry grades, one New York interest taking 5,000 tons, calling for delivery the third quarter of the new year. Recent sales for the most part, however, call further for immediate delivery, or for various periods up to the first half. Prices are firmer now than they have been in weeks, and look as if it would not take a buying movement of any great proportions to advance them. One of the principal reasons for this is the willingness of buyers to contract for protracted periods at ruling prices, and for substantial lots also. Several furnaces have turned down orders for shipment all of next year, because they think it to their interest to do so, and cite the present attitude of buyers as justification for their stand. Northern No. 2 foundry is still commanding $16.75 at Eastern Pennsylvania furnaces. Southern irons have been traded in a little more freely during the past week, Southern No. 2 foundry selling at $13.50 Birmingham. Although considerable has been said recently about possible imports of foreign iron, representative houses here declare no sales have been made. Cable dispatches today, however, state that the steamer Tantallon has been chartered in London to bring a cargo of 4,000 tons of Middlesboro No. 3 to Philadelphia. Middlesboro iron responded to the announcement, for after closing on Saturday at 49s 6d, it sold at 51s this morning, but closed at 50s 4½d. New York quotations at tidewater follow: Northern No. 1 foundry, $17.75 to $18; No. 2 foundry, $17.25 to $17.50; No. 2 plain, $16.75 to $17; Southern No. 1 foundry, $17.50 to $17.75; No. 2 foundry, $17 to $17.25; No. 3 foundry, $16.50 to $16.75; No. 4 foundry, $16 to $16.25.

Rails.—The Illinois Steel Co. booked an order during the week for 50,000 tons from the Chicago & Northwestern. Outside of the 100,000-ton order of the Michigan Central road, noted last week, it is reported that Vanderbilt interests have closed contracts for 126,000 tons.

Finished Iron and Steel.—Business in structural shapes during the past week has been good. The American Bridge Co. booked an order for 5,000 tons from the Cincinnati, Hamilton & Dayton road. The New York Central road gave an order for 12,000 tons to the Riter-Conley Co., and the poles to the McClintic-Marshall Co. The latter company and the Fort Pitt Co. divided an order of 6,000 tons from the Lackawanna road. The Harriman interests are expected to come into the market for a very large tonnage next year. They have an inquiry out now for 14,000 tons, which is in striking contrast with 1902 and 1903, their total purchases for these two years on bridge account not exceeding 5,000 tons. Plate orders are all running to small lots, but made up a goodly tonnage in the aggregate. Following the advances in sheets, trade fell off a little, buyers evidently having made purchases in anticipation of them. Bars are in better demand. New York prices at tidewater follow: Angles, 3 to 6 in. x ¼ in. and heavier, 1.64½c; beams, 3 to 15 in., 1.64½c; channels, 3 to 15 in., 1.64½c; beams, 18, 20 and 24 in., 1.74½c; tees, 3 x ¼ in. and heavier, 1.69¼c: plates, carloads, tank,

1.64½c; flange, 1.74½c; marine and ordinary fire box, 1.84½c; refined iron bars, 1.64½c; soft steel bars, 1.54½c to 1.60c; sheets, in carload lots, New York, No. 28, black, 2.50c to 2.55c; galvanized, 3.55c to 3.60c.

Old Material.—Very few transactions were closed during the week, but prices remain strong, with some slightly higher than the week previous. There is no disposition to do any trading until the new year, when an upward movement in prices and an increased volume of business are expected. Approximate prices are f. o. b. cars as follows:

Old iron rails	$17 00 to 18 00
Old steel rails, long lengths	15 50 to 16 00
Old steel rails, short pieces	15 00 to 15 50
Relaying rails	20 00 to 21 00
Old car wheels	15 00 to 15 50
Old iron car axles	20 00 to 21 00
Old steel car axles	17 00 to 18 00
Heavy melting steel scrap	15 50 to 16 50
No. 1 railroad wrought scrap	17 00 to 18 00
Iron track scrap	15 00 to 16 00
Wrought pipe	12 00 to 12 50
Ordinary light iron	11 00 to 12 00
Cast borings	8 00 to 9 25
Wrought turnings	11 00 to 12 00
No. 1 machinery cast	14 00 to 15 25
Stove plate	11 00 to 12 00

PHILADELPHIA.

The market is not as active as it was, but furnaces and mills are well supplied with orders and decrease in sales at this holiday period is not at all alarming. Consumption is increasing, prices are firm and the outlook for 1905 is encouraging.

Pig Iron.—Sellers are not willing to quote on large lots for delivery several months later. Buyers are pretty well supplied for the first quarter and ther is less activity in the market. With the disappearance of the drouth, one disturbing factor is removed. We quote as follows: No. 1 X foundry, $17.75 to $18; No. 2 X foundry, $17.25 to $17.50; No. 2 X plain, $16.50 to $17; gray forge, $16.25 to $16.75; basic, $15.75 to $16.25.

Finished Material.—The advances in prices announced last week and of 5 percent on bolts and nuts and $2 per ton on black sheets and tinplate probably checked buying somewhat, but they were expected and the effect is not very marked. The holiday lull is expected to continue till about Jan. 15. We quote as follows: Refined bar iron, $1.62½ to $1.65; steel bars, $1.53½ to $1.55 and to $1.53½ to $1.55 for plates, angles, beams and channels.

Old Material.—There is little buying at present and prices are not quotably different. We quote: No. 1 steel scrap, $16 to $16.50; low phosphorus scrap, $19.50 to $20; old steel axles, $19 to $19.50; old iron axles, $23 to $23.50; old iron rails, $20 to $21; old car wheels, $14.50 to $14.75; choice R. R. No. 1, wrought, $19 to $19.50; machinery scrap, $15 to $15.50; wrought turnings, $12 to $12.50; cast borings, $9.50 to $10; stove plate, $13 to $13.50; wrought iron pipe, $14.50 to $15.

The Metal Market.

NEW YORK.

OFFICE OF THE *Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., Dec. 27.

Pig Tin.—The market during the past week was in control of speculative interests, who put prices up here about 1 cent over our last week's quotations, while the advances of the metal in London averaged about £2. No recent development in trade circles operated to cause the advances, although it is said that there was a substantial increase in the buying in foreign markets. Closing prices today follow: Spot and December, 29.30c to 29.60c; January, 29.25c to 29.25c. London's closings today follow: Spot, £133 12s 6d; futures, £133. Arrivals at Atlantic ports to date aggregate 2,537 tons, with 1,735 tons afloat.

Copper.—The situation in copper continues dull, the one redeeming feature being the buying for export, but even this is about one-half less than for the past two months. Prices are unchanged, but their future course is difficult to gauge now. It is thought that early in the new year there will be developments that will admit of some predictions on that score. The London market for the week has been quiet, with prices slightly higher. Today's closings follow: Lake, 14⅞c to 15⅛c; electrolytic, 14¾c to 15c; casting, 14½c to 14¾c. London's closings today follow: Spot, £67 5s; futures, £67 10s. Exports for the month to date aggregate 11,314 tons.

Lead.—In moderate demand and still selling at 4.60c to 4.70c for spot. St. Louis is unchanged at 4.52½c to 4.62½c, according to brand. London is slightly higher at £12 13s 9d.

Spelter.—Is in good demand and higher at 6.00c to 6.12½c. St. Louis is stronger at 5.80c. London remains at £24 15s.

Antimony.—Prices are without change, Cookson's being 9.00c to 9.25c, Hallett's 8.75c to 9.00c, and other brands, 7.75c to 8.25c.

Quicksilver.—We quote $40 per flask of 75 lb. in lots of 100 flasks. London is £7 15s.

Nickel.—Sales are made at 40c to 47c for large lots down to a ton, and at 50c to 60c for small quantities.

CHICAGO.

Office of *The Iron Trade Review*,
1164 MONADNOCK BLOCK, Dec. 27.

Demand for metals continues quiet, which is attributed largely to the Christmas holidays which have intervened since our last report. Despite this lull in buying, however, prices hold up well. We quote as follows: Lake copper, in carloads, 15¼c; in less than carload lots, 15½c to 15¾c; casting copper, 15⅛c for carloads, and 15½ for smaller lots; pig tin, carloads, 30¼c; lesser quantities, 30¾c. Sheet zinc, 6.75c for carload lots of 600-lb. casks, and 7¼c to 7⅝c for less than carload lots. Pig lead, 4.60c for 50-ton lots, 4.75c for carload lots, and 4.90c to 4.95c for smalled quantities. Spelter 5¾c for carload lots, and 6c for lesser amounts.

Old metals are without appreciable change. Dealers prices are as follows: Copper wire and heavy, 12¾c; copper bottoms, 11½c; copper clips, 12¼c; red brass, 11½c; red brass borings, 9¾; yellow brass, heavy, 8½c; yellow brass borings, 7½c; light brass, 6¾c; tea lead, 4c; zinc, 4c.

Corrigan, McKinney & Company.

Corrigan, McKinney & Co.'s shipments from the Lake Superior region for the year have been as follows, by mines: Stevenson, 1,649,313 tons; Jordan, 97,473; total Mesabi, 1,746,786; Colby, 81,289; Ironton, 21,775; Meteor, 40,322; Puritan, not including all-rail, 1,259; total Gogebic range, 144,645. Armenia, 16,577; Crystal Falls, 239,173; Great Western, 56,785; Groveland, apart from all-rail, 3,712; Lamont, 17,204; Paint River, 3,204; Tobin, 239,609; total Menominee range, 577,064. Gross tonnage by water, 2,468,495. These operators are now preparing Dunn, Lamont and Great Western on the Menominee for operations in the immediate future, and will also unwater Commodore, on the Mesabi, which is a property they have done nothing with for some years, but which contains a considerable tonnage of good ore, though handicapped by a heavy water burden. It is supposed to be in rather bad shape underground.

The 1905 output at Stevenson is expected to be up to that for the present year, and at Jordan stripping will be carried on to prepare for as much of an increase as that small property will stand. Stevenson has a few years more of these enormous shipments in sight but of course such a great production as is coming from it will exhaust a mine that was never in the big tonnage class, in a comparatively short time. The Dunn will have to be opened as a new mine, and it is expected a larger tonnage of ore will be taken out than was ever handled from the old shafts. It will take a good while to unwater the property.

LAKE SUPERIOR CHARCOAL FURNACES.

The 140-ton charcoal furnace of the Lake Superior Corporation will blow in for the first time in a few days. This furnace is 13.5 by 70 ft, with three Foote firebrick stoves, and three Tod engines furnish air for it and the 225-ton coke furnace, which has been running some weeks. The two in operation will supply more than half the company's requirements for its Bessemer plant. The Zenith furnace at Duluth, which has a contract for 10,000 tons of Bessemer iron for this works, is now shipping about 200 tons a day.

Two other charcoal furnaces in the Lake Superior district are to be put in shape to blow in, not to mention the Boyne City 50-ton furnace that should be running this week. These are the old Carp furnace, of the Pioneer Iron Co. (Cleveland-Cliffs Co.) at Marquette, which is to be modernized by the addition of a larger blowing engine and other betterments and will be running during the coming summer; and the Newberry furnace, now owned by the Michigan Iron Co. (Berry Brothers) of Detroit. They both shut down during the summer of 1904, in accordance with an agreement for restriction of output. The Newberry furnace goes in during January after material improvements, including a new blowing engine of greater capacity, relining, new furnace top, and enlargements to the buildings. Its chemical plant starts up in a few days. This has been greatly enlarged and improved. The furnace and chemical works, which together with their subsidiary operations, employ from 400 to 500 men, are unique in that they are designed to make iron virtually as a by-product. The main thought in the operation of the works by Berry Brothers was to furnish their varnish works with an ample and reliable supply of wood alcohol at reasonable cost.

Business Methods as Applied to Labor.

Business ideas—business ideas pure and simple—applied by the employer in the management of labor, will enforce the business idea upon the laborer as it can and will be enforced in no other way. When the employer class is once properly organized and applies business methods to all the ramifications of business problems, then labor will become perfectly organized also for the reason that otherwise capital properly organized will not recognize it. The business idea must be supreme—it must prevail in the capital class and in the labor class. Then that nightmare of the employer, that handicap of honest labor—disorganized labor—will disappear.

Wherever a thorough business system has been applied to labor conditions the tendency has been to establish uniformity among the various classes of labor in the respective industries, and besides this, it has not only brought together in friendly intercourse employers and their own employes, but has induced friendlier relations between employers themselves, where they too often stood apart and regarded each other with suspicion or distrust.

The more perfect this system becomes and the more generally adopted, the more readily will the difficulties in the labor world yield to intelligent, businesslike treatment. Thus all the elements on both sides, if brought together on an equitable business basis, can solve the labor problem; for then and only then will each side to that problem be willing to admit its share of blame for labor troubles, or assume its share of responsibility in righting them. Then, too, under such a system will the right sort of commissioner concern himself less with plans for settling strikes than with plans for removing the occasion for strikes, for it is too often the case that friction exists, or that strikes occur, because no effort whatever has been made to remove the occasion for either the one or the other.

This system has, further, a great public advantage, an advantage which will be apparent to the public and which the public will appreciate. Publicity is now demanded by the public. Under this system the press will have a new source—and a reliable source—from which it can obtain information, not only regarding labor disputes, but regarding affairs in the industrial world generally. The public can then inform itself for there will be, at least on the employers' side, one authorized spokesman responsible to the public. It will then be possible to prevent that interference by "intermeddlers" which in the past has resulted in so many conflicts between capital and labor or by which differences have been aggravated—and which has added so much to the cost of production—a cost which the public has always been obliged in the end to pay. Then industrial troubles will be settled within the industrial family, and not, as is now often the case, left to mischief-makers or to well-meaning outsiders, who in the very nature of things, cannot be expected to understand these troubles thoroughly.—[Herman Justi, Commissioner of Illinois Coal Operators' Association.

Aultman Company Liquidation.

The creditors' committee of the Aultman Co. of Canton, O., and allied corporations have submitted to the depositors under the liquidation agreement of Oct. 6 a plan for the liquidation of all the concerns. It is proposed that the committee acquire at such price and in such manner as it may deem for the best interest of the creditors of the several companies who shall deposit their claims with it, such portion of the assets of the Aultman Co. of Ohio, the Arctic Machine Co. of Ohio, the Cedar Rapids Supply Co. of Delaware, doing business at Cedar Rapids, Iowa, the Western Supply Co. of Illinois, the Kenyon-Rosing Machinery Co. of Minnesota, and the E. T. Kenny Co. of Indiana, as may be offered for sale by receivers or trustees in bankruptcy of those estates, or otherwise, at prices the committee may deem advantageous for the benefit of depositing creditors. The net proceeds realized from the sale of assets acquired from the Aultman and other companies are to be distributed pro rata among creditors. It is expected that by acquiring the assets at bankruptcy sales, better results will be attained than if creditors were not represented at the sales.

The industrial department of the Erie railroad, 21 Cortlandt street, New York, of which Luis Jackson is the head, has issued a pamphlet showing the new manufacturing plants located on the Erie railroad during the fiscal year ending June 30, 1904. The list is a long one and shows that the strong points presented by this railroad to the consideration of manufacturers have been appreciated.

The Citizens' Alliance of Joliet, Ill., has issued a handsome pamphlet describing the advantages of Joliet as a manufacturing city. Numerous attractive features are mentioned, but "Industrial Peace Guaranteed" is the point upon which special emphasis is placed. The labor question was a serious one with manufacturers at Joliet for a number of years, but the citizens decided that the town should be run on a conservative business basis and that the radical labor element must be overcome. The Citizens' Alliance was formed about a year ago and conditions are now in a different shape entirely, so that the Alliance feels that it can guarantee industrial peace to any and every one seeking a new location.

John F. Allen, 370-372 Gerard avenue, New York City, manufacturer of the Allen portable pneumatic riveting machines reports the following recent sales: Fenwick Freres & Co., Paris, France; John Turbull Jr., & Sons, Glasgow, Scotland; Cambria Steel Co., Johnstown, Pa.; Middletown Car Works, Middletown, Pa.; B. & O. Railroad.

Work on the erection of the new tube mill for the Youngstown Iron Sheet & Tube Co., Youngstown, O., is progressing favorably. The foundations are all completed and the erection of the structural work has already been commenced. Some of the machinery for the mill is already on the ground and the plant is expected to be completed early next year.

PRESIDENT OF THE A. S. M. E.

John R. Freeman of Providence, R. I., the new president of the American Society of Mechanical Engineers, was born at West Bridgeton, Me., July 27, 1855. He received a public school education, followed by the civil engineering course at the Massachusetts Institute of Technology and here he graduated in 1876. His public school vacations had been spent as a rodman with the Water Power Co. of Lawrence, Mass., and while he was enrolled at the institute he spent the summers with the same company as computer, draftsman and assistant. On graduation he joined the regular forces of the same company, and later became principal assistant to Hiram F. Mills, chief engineer of the Essex Co. During the ten years Mr. Freeman held this position he was engaged on numerous surveys and designs for water power improvement in New Hampshire, Vermont and Massachusetts, and had charge of the daily measurements of the water power employed by the factories at Lawrence, Mass., and also made measurements at Manchester, N. H., for the factories there. He then accepted a position as inspector and hydraulic engineer for the Factory Mutual Fire Insurance Companies, having at that time and since made quite a specialty of fire protection engineering. His experiments on the discharge of nozzles and the hydraulics of fire streams have become standard and his ability in this direction had unquestionably much to do with his selection for the work of reorganizing the inspection service of the insurance companies retaining him, and he was placed in charge as chief inspector and chief engineer. Some two thousand mills at approximately a value of over a thousand million dollars are combined for fire protection in the Factory Mutual Fire Insurance Companies.

JOHN R. FREEMAN.

Mr. Freeman has done much to establish standards, and the specifications generally adopted by manufacturers were drawn up by him after considerable experimental work on fire pumps, nozzles, hose, etc. In 1896 he became president and treasurer of the Manufacturers' Rhode Island & Mechanics' Mutual Fire Insurance Companies and under his charge the business has increased more than threefold. The success of what was virtually a consolidation of the two oldest companies of the kind led to the choice of Mr. Freeman in 1903 to succeed Col. Thomas J. Borden on the death of the latter, and he became president and treasurer of the three fire insurance companies—the State, Enterprise and American. He is now, therefore, in charge of the fire protection and insurance interests of more than $335,000,000 worth of property. From 1894 to 1896 Mr. Freeman was the active member of the water board of Winchester, Mass., and in 1896 he was appointed a member of the Massachusetts Metropolitan Water Board, entrusted with building water supply works for Boston and neighboring towns. He was three times appointed by the supreme court during his residence in Massachusetts to be one of three commissioners to appraise the value of private water works at Newburyport, Gloucester, etc. In 1899 Mr. Freeman was selected by Comptroller Coler of New York to investigate the water supply of that city. The investigation was an elaborate one and the work was completed with surprising speed. The request was received on Aug. 24, 1899, and the report was handed to Mr. Coler seven months later. It contains various original investigations of more than local interest and makes a book of about 600 pages, illustrated with numerous maps, diagrams and designs.

Mr. Freeman was chief engineer of the committee appointed in 1901 to consider the advisability of building a dam across the Charles River between Boston and Cambridge and the report contains some 600 pages. He has recently been associated with Messrs. Burr and Hering on an additional water supply for the city of New York. He has been consulting engineer for a number of water works development enterprises. Mr. Freeman was appointed in 1902 by Secretary of War Root as civilian mechanical engineer member of the board for testing gun carriages for sea coast fortifications. This led to the report deciding in favor of the Crozier carriage. He was elected a member of the American Society of Civil Engineers in 1889, was a director from 1896 to 1898 and vice president in 1902-3. He has twice received the Norman medal of the society, once for a paper on the hydraulics of fire streams and on another occasion for a paper on the nozzle as an accurate water meter. He was president of the Boston Society of Civil Engineers in 1893 and last year was elected a vice president of the American Society of Mechanical Engineers. He is also a member of the corporation of the Massachusetts Institute of Technology, a trustee of Butler Hospital, and a director of the National Bank of Commerce and of the People's Savings Bank of Providence, R. I.

It is announced at Washington, although not officially, that a satisfactory test of an armor plate, made by the Midvale Steel Co., took place at Indian Head Proving Grounds a few days ago. It was a private test, made solely for the information of plate makers, and officers of the Bureau of Ordnance feel that they are not at liberty to make public all the facts with regard to it. An eight-inch side armor plate was submitted to the assault of armor-piercing shells from an eight-inch gun.

The grand jury of Chicago, December 23, returned two indictments against Isaac N. Perry, former president of the National Bank of North America, charging him with arson in connection with the burning of the plant of the Chicago Car & Locomotive Works, at Hegewisch, Ill. At a preliminary examination before a justice of the peace, Mr. Perry was acquitted, but the accusation against him was taken before the grand jury.

The plant for testing engines which the Pennsylvania railroad erected at the St. Louis Exposition at a cost of $250,000 is to be located permanently in Altoona, Pa. All the machinery will be shipped to Altoona and set up in a building especially designed for it.

The Remington Typewriter Co. distributed $15,000 in gold among 250 employes, December 22, as a semi-annual bonus to employes of 10 years or more continuous service.

NEW BLAKE & JOHNSON TOOLS.

Blake & Johnson, of Waterbury, Conn., have designed and built a machine for rolling the heavier class of wheel rims as at present used in automobile construction. This rim-rolling machine is illustrated in Fig. 1.

The rolls for giving the proper contour to the rim are placed upon the shafts B and B; the lower shaft is positively held in position, and the upper shaft has an adjustment of 5 in., obtained by the two screws shown at A and A, and these are in mesh with the pinion and hand wheel above. When it is proposed to make a rim the upper shaft B is raised, in order to allow the flat stock to get a start. The two side arms with their hand wheels E and E cause the carriages which carry the rollers for creating an arc of the rim at C and C, to be moved laterally as the case may require. These two rolls C and C are also actuated in their relative positions through the hand wheels D and D to produce the required arc on the rim. Should the stock start to skew, the two lateral arms that are actuated by the hand wheels E and E can be off-set either way by the hand wheels F and F, which throw them in the desired direction from a true plane, thus causing the rim to right itself while being rolled.

As these operations take place, the operator lowers the shaft B by means of the hand wheel connecting the two screws A and A. In doing this it is very essential that there should be no slippage between the upper and lower shafts B and B. The upper shaft is therefore kept in absolute mesh by the rocker arm system of transmission.

These machines are furnished with right and left friction clutches as it quite often becomes necessary while forming the rim to reverse the motions, suitable provision being made for this purpose, as will be seen on referring to Fig. 1, which shows the reverse lever very clearly on the right of the machine. The operator need not leave his work and still be able to run the machine in either direction as the case may require.

FIG. 1.—THE NO. 2 RIM ROLLING MACHINE.

Figs. 2 and 3 represent one of the latest designs of arch presses with new friction disc roll feed, built by Blake & Johnson. These presses are specially constructed for producing sub-press work which demands a high degree of accuracy. In a great many cases the operations are intricate as well as delicate, the work in such subpresses usually being reversed, that is to say, the die takes the place of the punch and vice versa. As this subpress die is operated, the piece is forced up into the die and then pushed back in the stock. To do this, and have the work come out straight, it is very essential that these dies are nicely adjusted within themselves, and

after this, that the gate which controls the working of the die should have an absolute adjustment that will positively force the punch in the die and no further.

In order to do this the makers have adopted the dovetail taper wedge system. After the die is approximately set, the operator gets his fine adjustment from the hand wheel shown in conjunction with the screw which actuates this dovetail wedge, and when placed in the proper position the adjustment mechanism is locked. After having these features well safeguarded, it is equally essential that the feed should be as near positive as it is possible to produce it. Reference to Fig. 3 will show very clearly the construction of the new friction disc feed. G is a cast iron disc which is free upon the shaft E. This in turn supports the hardened and ground tool steel ring A, which is also free until the locking pin F connects it with the disc G. The tool steel disc B is keyed upon

FIG. 2.—THE NO. 6 ARCH PRESS.

the shaft E, which in turn carries the feed roll. In the disc B are four receptacles for carrying the rolls shown at C. These are also hardened and ground. In order that there may be no slipping when the hardened rolls C come into action, they are positively actuated by the spring D.

The connecting rod is first adjusted for the proper feed by appropriate setting upon the disc on the press. The reciprocating motion of this connecting rod causes the rolls C, when going in the direction of the arrow, to grip the surfaces, The instant this takes place, the disc B must travel. Should, for any reason, a kink present itself in the metal, the more resistance it creates and the tighter the rolls C will wedge between the disc B and the ring A. The moment the reverse motion takes place, it causes these rolls to promptly free the parts and consequently release the feed. Ignoring the possible variation in thickness of stock, this has made by far the most accurate feed known to the firm.

Record Run of a Westinghouse Turbine.

A memorable incident of the morning following the close of the St. Louis Exposition was the formal shut-down and inspection of the 600 horsepower Westinghouse steam turbine generating unit in the Palace of Machinery after a continuous run of over 3,962 hours—a performance which has had no parallel in steam turbine history. This machine was started on its long run at 9:20 o'clock on the morning of Monday, June 20, shortly after its installation at the Fair, and was stopped at 11:32 o'clock on the morning of Friday, December 2. During the five and a half months that the unit was in operation is supplied current for light and power throughout the Westinghouse exhibits in the Palaces of Machinery, Electricity and Transportation. Charles F. Foster, chief operating engineer of the Exposition, H. M. Holman, supervising engineer at the Government Exposition gas engine tests, formerly president of the St. Louis Board of Public

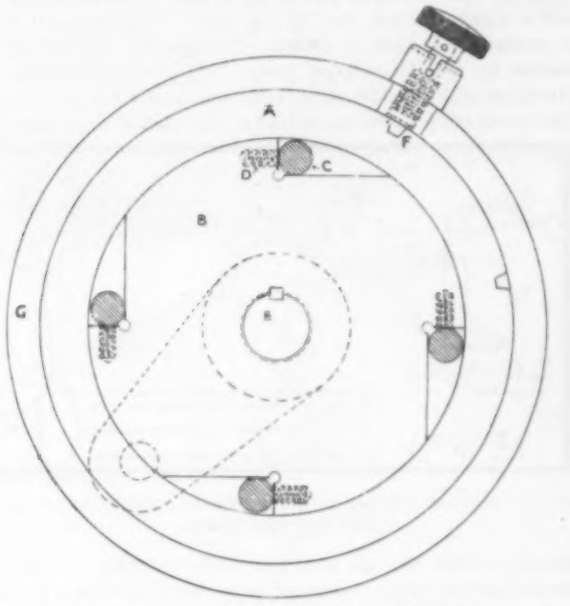

FIG. 3.—THE NEW FRICTION DISC ROLL FEED.

Works, and a number of Westinghouse representatives were present when the engine was stopped. It was found to be in perfect condition, and there were no signs of wear, the bearings still retaining the tool marks as they came from the shops. The remarkable feature of the turbine run, of course, was the maintenance under load of a speed of 3,600 revolutions a minute for such a long period. From 8:30 o'clock in the morning to 10:30 o'clock in the evening, the load carried throughout the Exposition varied from 25 percent underload to 25 percent over load. The total number of revolutions almost touched the billion mark—855,792,000.

Alexander Thomas, secretary of the Crucible Steel Co. of America, Pittsburg, in a recent interview stated that the condition of the company is so satisfactory that the management has decided to defer the issue of $7,000,000 of bonds for the present. The profits are being used to wipe out the debts and as none are pressing it has not been found necessary to make the bond issue decided upon some time ago.

Tax Collector Vescelius, Hackettstown, N. J., has sold the furnace property belonging to the Carteret Steel & Iron Co. of that city at public sale to John Karr for $300. The plant was constructed some years ago for making steel direct from ore, but was not a success.

PROGRESS ON THE BARABOO IRON RANGE.

BY D. E. WOODBRIDGE.

Two new iron ore fields have been shown in the Northwest during the past two years. One is that in Aitkin and Crow Wing counties, of Minnesota, whose values are still very problematic, and the other is that of Baraboo in south central Wisconsin. The Baraboo region has been sufficiently tested and has sent enough ore to market to determine something as to qualities and kindliness of the ores in furnace treatment.

The Wisconsin Geological and Natural History Survey some time ago printed a report on the Baraboo iron bearing district, written by S. Weidman, geologist in charge of the work in central and northern Wisconsin. While geologists are very doubtful of Mr. Weidman's conclusions as to the genesis of this ore, and think that he will have to bring to the support of his theories a good deal more evidence than has yet been adduced, they accept his statements of facts and conditions as correct.

The district is near the center of the southern half of the state in Sauk and Columbia counties, with a length east and west, as Mr. Weidman measures, of approximately 28 miles and a width of from two to ten miles. Twenty-eight miles is probably an extreme length. Geologically the district is similar to the Menominee range, and its outcroppings of Huronian rocks are the same as in that better known district. The ore-bearing formation, so far as determined, is surrounded

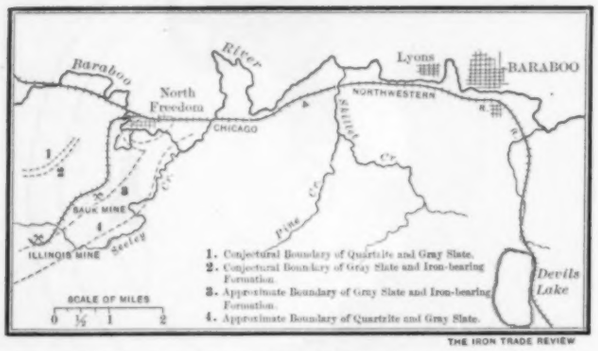

FIG. I.—MAP OF BARABOO DISTRICT SHOWING LOCATIONS OF SAUK AND ILLINOIS MINES.

almost entirely by high quartzite bluffs inclosing a long and rather narrow valley whose strike is nearly northeast by east and whose elevation is from 800 to 900 ft. above the sea. Most of the work that has been done so far in this district has been in the west end of this valley, southwest from the village of North Freedom, and here the Illinois, LaRue and Sauk mines have been more or less proved. The Illinois is at present the only property in operation. In the eastern end of the district, some 12 miles from this group of discoveries, drill operations have been under way for Pittsburg interests under charge of Mr. O. Rohn, and several drills are now busy north from the important finds, for the Pittsburg Steel Co. In fact, the work of this company is by far the most important exploration under way in the region. It is understood that no important finds have yet been made by this company.

The writer well recollects how, ten or twelve years ago, Mr. W. G. LaRue, a trained field geologist and iron ore man from the Illinois Steel Co., said in conversation that he knew where there was an iron district that had not yet been found, and that he was going there when he was in position to do so. It was six or seven years before Mr. LaRue found himself in position to go ahead with this work, and in April, 1900, his drills cut ore. Prior to this an exploration had been started by what was known as the Douglas Iron Co. on the Douglas farm, where a well digger had struck the iron formation. Nowhere else did it outcrop so closely. Throughout the entire district the iron-bearing member is hidden under a varying thickness of horizontal-lying Cambrian sandstone and of drift, up to more than 600 ft.; and that it was found at all is a fact on which the discoverer can pride himself greatly. The original exploration had cut a large amount of paint rock, and this had been used by the Chicago & Northwestern Railway as a source of mineral paint for ten years before Mr. LaRue showed its connection with the more valuable ores. The presence of characteristic quartzites and of bunches of brilliant specular iron that occurred occasionally therein, led many early observers to believe in a possible correlation of the region with the Lake Superior district, and as early as 1882 it was recognized by Prof. Chamberlain in his report on the geology of the state.

Since 1900 exploration and development have been continuous. Mr. LaRue estimates that at least 18,000,000 tons of merchantable ore has been shown on properties in which he is interested as a fee owner. He figures this largely from the fact that at the Illinois mine, which was his first exploration, ore was cut 2,000 ft. on the dip of the formation from the outcrop, and 1,000 ft. below surface, on the pitch of the lode. Holes separated by about 1,200 ft. along the strike have cut the same character of ore, indicating a very large body. Nobody claims that all this measurement of ore is of marketable grade. Car shipments are not, of course, especially accurate as determining the character of a large ore body, as their grade can be changed from day to day, if desired, to suit conditions; but it is interesting to note the grade and quantities of ore shipped from this mine in the past season. June shipments average four cars daily, and the assay average was: Iron, 57.37 percent; phosphorus, .050; silica, 13.63. In July daily shipments increased to better than five cars and grades diminished a trifle in iron and phosphorus and increased about 2 percent in silica. For August and September daily shipments were still larger, varying from five to twelve cars daily, and average values were about the same as in July. The ore carries a high percentage of moisture, averaging about 12.5 percent.

The Illinois and LaRue mines together with the "North Freedom" prospect have been leased and are operated by the International Harvester Co., with Jos. Sellwood, of Duluth, as manager. The Sauk mine is under lease to the Iroquois Iron Co., managed by H. B. Sturtevant, of Duluth. It is one of the constituent companies through which the various furnaces in which the firm of Rogers, Brown & Co. is interested secure their supply of iron ore. The Patterson and Wisconsin groups of properties are owned by local people, and are idle. Mr. Rohn has a large area in the eastern end of the basin that he is exploring for W. H. Donner and others and four drills have been working for the Pittsburg Steel Co. near and northeast from North Freedom.

Mr. Weidman finds the thickness of the Baraboo quartzite to be from 4,000 to 5,000 ft., on the assumption of little or no important faulting throughout the region, and there are no evidences of important faults. The thickness of the ore-bearing formation has been found by considerable drill exploration to vary from nothing to 500 ft. and to a possibly indefinite greater amount. This ore-bearing rock includes slate, chert and iron ore and all gradational phases between them. The upper member of the Freedom formation, in which ore is found, is a dolomite, occasionally ferruginous. The ore is mainly hematite, and much of it is of Bessemer grade or close to it, phosphorus running from .040 to .055. While much of it is soft, it is more of the nature of the Menominee than of the characteristic soft ores of the Mesabi. Samples taken from the stock pile of the Illinois mine a year ago by Dr. V. Lenher gave results of 62.75 iron. This is, however, considerably higher than most chemists have lately been able to secure and probably cannot be duplicated under ground at the present time, except by selected samples. Mr. LaRue has

found, what is a not uncommon fact in drill work in the Lake Superior region, that drill samples often understate quality and he has case after case at the Illinois and other explorations at Baraboo that show the ore to be actually from 10 to 18 percent better than the drill records indicated. The richest ore is soft and does not give a core, while it grinds up so fine that some of it is probably lost in the sludge. The silicious streaks are harder and more readily preserved for chemical analysis and examination.

The Illinois mine has been opened by a shaft that is 400 ft. deep, dipping north at an angle of about 60 deg. It was started on an outcrop of lean silicious ore and near an old paint rock pit. For its upper 100 ft. it runs through jasper, then cuts sharply into the underlying gray slate, in which it remains to the bottom. On the 300-ft. level a cross-cut was driven north toward the iron formation that had been shown by a drill hole. This working cut the slate for 65 ft. and then ran through the formation, a lean ore and jasper, for 136 ft. From that point for 26 ft. an ore was cut that averaged at the time better than 60 percent iron and beyond this was the roof of the deposit, a slate and limestone. Longitudinal workings on this level are now 1,250 ft. long, east and west, and ore is being stoped out. At the 400-ft. level a similar cross-cut was driven through the same gray slate, the same mixed ore and jasper, and the same better ore, but each of the formations showed a greater thickness, so that instead of 26 ft. of ore there were 43. This sampled out an average of 53.5 iron and .061 phosphorus. On this level openings in the ore aggregate about 600 ft. Still further to the north, and 2,000 ft. from the shaft, a hole was sunk about 1,200 ft. vertically and at 1,000 ft. down this hole cut ore for 50 ft. Underneath were 65 ft. of red slate and another lens of ore 60 ft., and then the rod passed into a gray slate identical with that in which the shaft had been sunk. For the entire depth of this shaft the formations cut were practically identical with those cut in the workings 2,000 ft. to the south. This indicates quite clearly the persistency of the formation with depth. It is Mr. LaRue's opinion that the ore follows rather closely the upper side of the iron-bearing formation, and not far beneath the Potsdam.

This Potsdam is as thoroughly saturated with water as a sponge and water has been the great obstacle to mining operations thus far. At the Sauk mine they found it so serious as to entirely stop all work, and a considerable expense must be undergone before the mine can be unwatered and worked on a considerable scale. This is one of the difficulties of the district. Another is what has been mentioned, that there is no outcropping; that the relation of the sandstone and quartzite is one of unconformity and bears not at all on the contact between the iron-bearing member and its bounding rocks. There is a very heavy bed of sandstone above the formation, varying up to several hundred feet vertically. This was laid down after the ore was formed and after surface contours, possibly resulting from its formation, had been completed. Therefore the present surface is of no especial interest to prospectors. It is a fact that in many iron districts, especially the Mesabi, the contour of surface is a key to the possible presence of ore that is regarded as of the utmost moment. No such key exists on the Baraboo. Exploration has been by drills throughout and this is slow and costly and requires systematic, methodical and careful work. As the result the opening of the district will probably be tedious and it is doubtful if its full value is understood for some years, even though the promising region is small.

In exploration it has been found that the ordinary walking beam well drill is the fastest machine for penetrating the soft formations of surface and sandstone; but when the drills have cut to the dolomitic limestone diamonds have been substituted. The cost of this work is considerably less than similar drilling on other Lake Superior ranges, and the sandstone is cut for not over $1 a foot, while the diamond drilling in harder rocks is considerably less than the price universally paid for drilling jasper on the Mesabi or Vermillion ranges. No exploration has been undertaken outside the quartzite rim of the Baraboo basin proper, and it is not supposed that conditions there favored the presence of iron ore.

This new district is economically to be considered as a competitor of the Menominee, rather than any other of the Lake Superior districts. The future of any region, containing good grade Bessemer old range ores and as close to Chicago by freight rates as the Mesabi to the upper lake docks and available for all-the-year shipment, would appear to be very promising. At present it costs 85 cents a gross ton to get ore from North Freedom to furnaces at Chicago, while it costs 80 cents to get it from the Mesabi to Duluth and Two Harbors. From these latter points the cost of lake transport to Erie ports will average about the same as the rail haul, so the cost of getting Baraboo ore to furnaces at Chicago is practically half the charge against Mesabi ore to furnaces along Lake Erie. If the Pittsburg district is considered, the differential is about as one to three. Baraboo ore can be

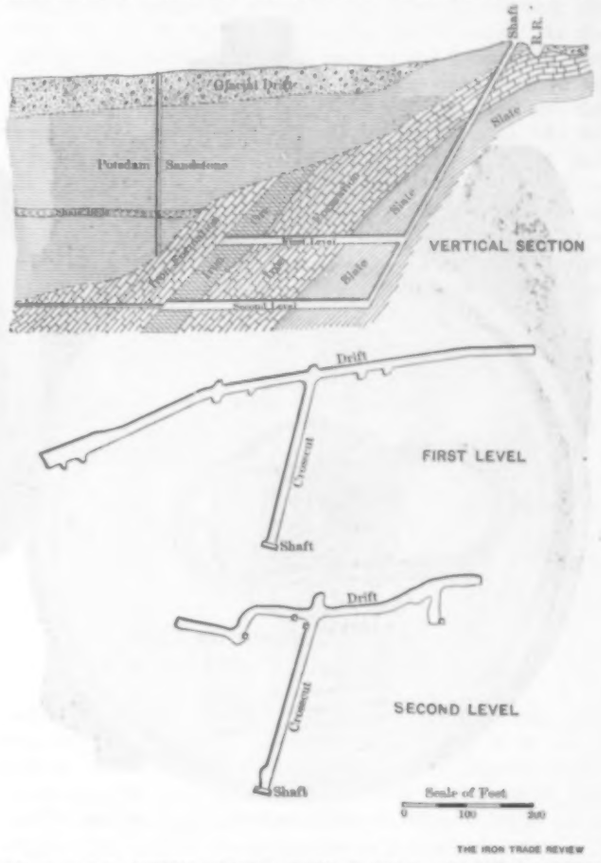

FIG. 2.—CROSS SECTION OF THE ILLINOIS MINE, AND GROUND PLAN OF THE FIRST AND SECOND LEVELS.

hauled to Chicago through the winter, as there are so few severely cold days that they need not be considered. Menominee ore also goes to Chicago all rail, and all the year round, but the cold is more intense than further south and will make handling more difficult.

Baraboo probably has a very large tonnage of rather lean ores, running from 45 to 55 percent and many of them Bessemer. These will compete with the lean silicious Bessemers of the Menominee range. There are in the latter district, as is well known, immense deposits of these ores running from 40 to 45 percent iron, about 35 to 38 percent silica and very low in phosphorus. They are largely on or near the surface and can be mined at extreme low costs, a good deal lower, doubtless, than any figures that can be hoped for from Baraboo. With the advent into Baraboo of a second railway, the Chicago, Milwaukee & St. Paul, and with a larger tonnage to be moved, it is probable that the freight rate of 85 cents to Chicago may be reduced. Excessive moisture of Baraboo ores may have some effect on them in competition, as the lean Bessemers of the Menominee are quite low in moisture.

AN INDICATING STEAM METER.*

BY C. E. SARGENT.

That there has been for many years and is an ever increasing demand for some practical device which will measure or indicate the amount of steam in pounds which is delivered through pipes to an engine, radiator, or steam pump is apparent to the engineer as well as the manufacturer and the tenants and landlord who buy or sell steam for power or for heat. A simple, cheap and fairly accurate device, applied to the supply pipes of high duty engines and low duty direct acting steam pumps should do more toward revolutionizing the present methods of feeding boilers, pumping water for elevators and kindred purposes than all the testimony of mechanical engineers as to the inefficiency of such means. Seeing is believing, and when the manager can see that a certain steam pump is taking six or seven times as much steam per horsepower hour as the automatic engine by its side, then power pumps and more efficient apparatus will be put in. The expense of

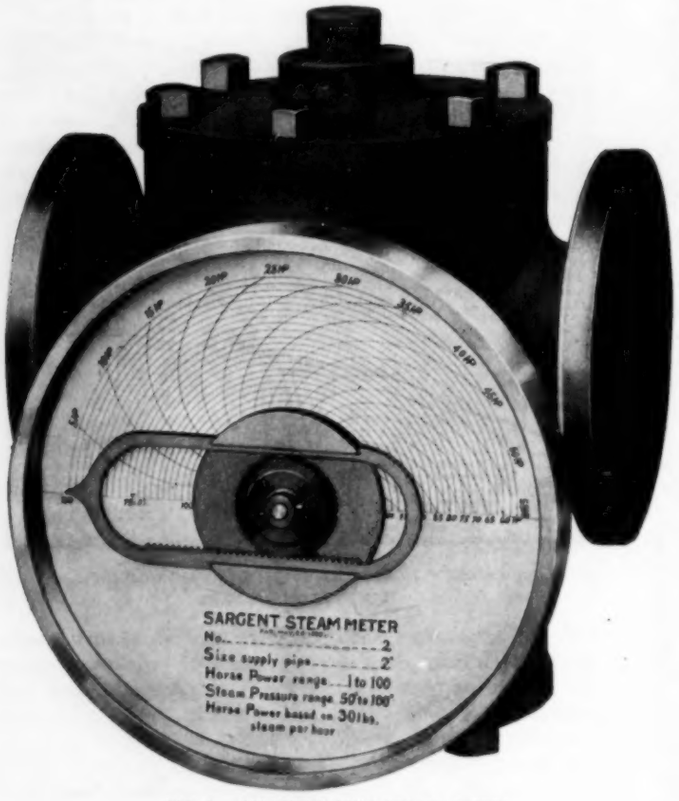
SARGENT STEAM METER
No. 2
Size supply pipe 2"
Horse Power range 1 to 100
Steam Pressure range 50 to 100
Horse Power based on 30 lbs. steam per hour

FIG. 1.—AN INDICATING STEAM METER.

making efficiency tests of small plants is so great, that probably not one engine in twenty is tested for economy, and the salesman with the inefficient engine, knowing that there is but a slight probability of any test being made, makes as good a guarantee as the competitor with a more efficient machine. If a steam meter in the supply pipe would show exactly the amount of steam going into the engine, any leak or accidental derangement of the valve setting would be instantly discovered with a constant or regular load on the engine.

The need of a steam meter has been so great that several devices have been designed for the purpose, but on account of the changing conditions of the product with which we have to deal, only partial success has been attained.

If there is a constant difference between the pressures each side of a certain opening, the amount of steam flowing through that opening will depend on the area and the density of the steam which varies with the pressure. If the initial pressure and the difference in pressures remain constant, then the weight of steam flowing through will depend on the area of the opening, and if the opening is constant, the weight of steam flowing through will vary with the pressure and the difference of pressure on either side of the opening. If the difference in pressure between two tanks is 1 lb., and the initial pressure varies from 50 to 100 lb., twice as much steam will flow through a certain opening with 100 lbs. pressure as would flow through with 50 lb. pressure. In the meter under consideration, which is designed for steam pressures of 50 to 100 lb., a drop of 2 percent is thought advisable, and the areas are proportioned accordingly. When steam is flowing through, the opening will adjust itself, so that the difference of pressure is always a percentage of the pressure on the inlet side.

Any tendency of the pressure to equalize will immediately close the valve, and by throttling the passage, reduce the outlet pressure below the inlet pressure as designed. Any tendency for the outlet pressure to reduce more than 2 percent below the inlet pressure will raise the valve and increase the area of the steam passage. Slugs of water coming with the steam cannot by inertia open the valve D because they can not strike the valve except radially, and it is balanced against such a force. The inertia of water striking unprotected floating valves or vanes of steam meters at 100 ft. or

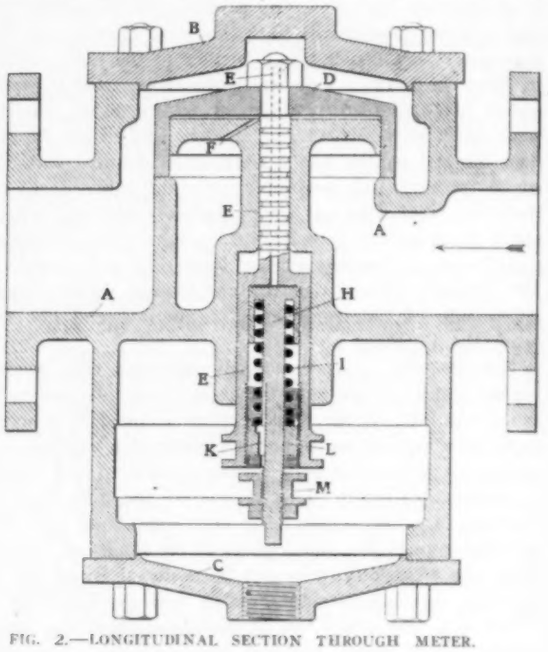

FIG. 2.—LONGITUDINAL SECTION THROUGH METER.

more per second, would necessarily cause derangement. As the opening F is small and changes the direction of any water which might tend to go through should the valve suddenly open, no harm can arise from water in steam, except, possibly, to introduce an error in indication. We see now that the main valve stem E will stand between the position of the full opening or the complete closure of the valve, depending —of course—on the amount of steam passing through, and the position of this valve stem determines the movement of the indicating finger around the center of the dial through mechanism hereafter described, and shown in Figs. 2, 3 and 4.

If the steam always had the same density, that is—if a certain volume always had a certain weight, no further indicating apparatus would be necessary, but as the weight per volume varies with the pressure, the same quantity of steam under double the pressure will flow through one-half the area for the same length of time; also if the difference in pres-

*Read at the New York meeting (December, 1904) of the American Society of Mechanical Engineers.

sure increases with the absolute pressure, more steam will flow through a certain opening when the pressure increases than if the difference in pressure each side of the opening remained constant.

On the assumption, then, that pressure times volume equals a constant (PV=C) which is near enough for practical purposes, we can determine the amount of steam passing from one receptacle to another, if we know the difference in pressure in the two receptacles, by determining the area of the opening through which the steam flows, but as the weight of steam passing through a defined opening will vary with the pressure, and the difference in pressure each side of the opening, then we must vary our opening with the pressure if a uniform weight is flowing through. And this is the principle upon which this meter is based. With a constant weight or horsepower passing through, the pointer will follow the horsepower curve on the dial though the pressure of the steam varies between the limits of the meter. Meters having an adjustable opening through which the steam flows have been made and with a constant pressure record fairly accurately the pounds of steam passing through them, but with a variable pressure, from the nature of the device, the indica-

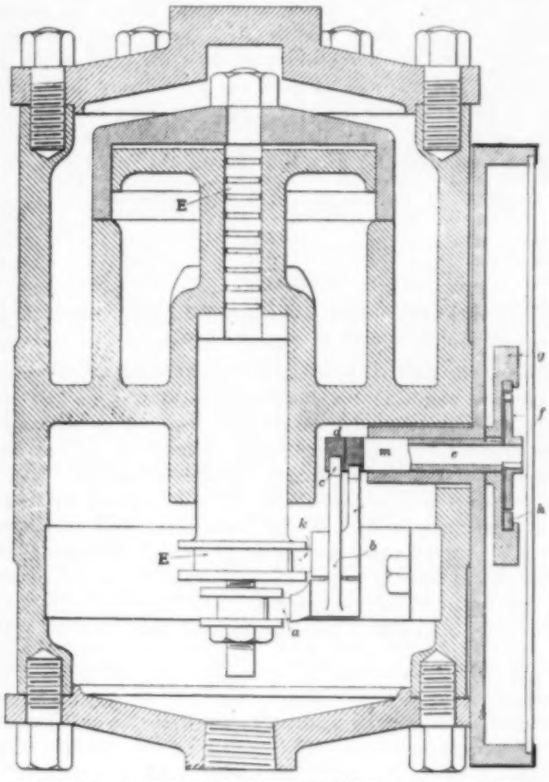

FIG. 3.—TRANSVERSE SECTION THROUGH STEAM METER.

tion would be inaccurate. Water can in no way affect the mechanism of the meter herein described, as all moving parts are protected from derangement caused by the inertia of water passing through the openings.

Fig. 1 is a half-tone of a 2-in. meter showing the dial side and compensating pointer. It is flanged and faced and can be inserted in the steam pipe as an ordinary 2-in. globe valve. This particular meter is calibrated to show the horsepower (based on 30 pounds of steam per horsepower hour) passing through with a steam pressure of between 50 and 100 pounds. Fig. 2 is a longitudinal section. Fig. 3 a transverse section. Fig. 4 an elevation of the indicating mechanism looking towards the back of dial.

Referring to Fig. 1, if no steam is flowing through the meter, the pointer will indicate zero horsepower as in the figure, but will indicate the pressure if it ranges between 50 and 100 lb. As the end of the pointer will not begin to move towards the center of the dial until the pressure reaches 50 lbs., it will stand at 50 lbs., when there is no pressure in the meter. If 40 horsepower were passing through, the pointer would so indicate, and if the pressure were raised from 50 to 100 lb., the end of the pointer would follow the curve of 40 horsepower from the 50 to the 100 pressure limit.

In Fig. 2, which shows the steam passage and moving parts, A is the body of meter, B the top cover, and C the bottom cover; D is the self-adjusting valve which remains seated when no steam is passing through the meter, and which is held in place by and fastened to the valve stem E which works in two diameters in the body A. The bottom cover C is tapped for ¾-in. pipe which connects the meter to the atmosphere or sewer.

The action of the meter is as follows: steam is admitted on the side of the arrow and surrounds the valve stem guide; as soon as pressure accumulates it passes through the small hole F, and raises the self-adjusting valve D, allowing the steam to pass to the outside and top of the valve. As the bottom end of the stem E is open to the atmosphere, the pressure on top of the valve D tends to close same by an amount of pressure equal to the pressure in the meter into the area of the valve stem immediately below the valve. As the pressure under the valve is always tending to open it, and the pressure on the stem is always tending to close it, there will be a difference in pressure between the inlet and outlet of the meter equal to the difference in area of the valve and valve stem. As these areas are so designed that the ratio is about 50 to 1, the pressure of steam on the discharge side of the

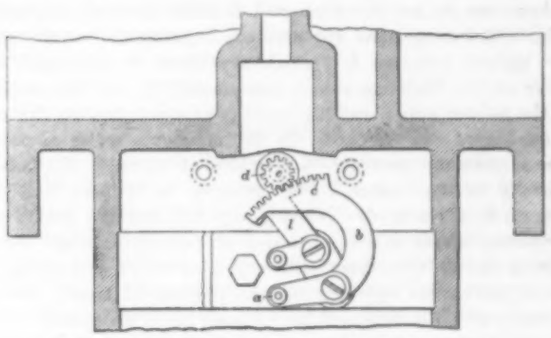

FIG. 4.—ELEVATION OF THE INDICATING LEVERS.

meter will be 2 percent less than on the admission side with any pressure carried. By a proper proportioning of the valve and the valve stem areas, a minimum drop of pressure of the steam passing through, practically, with the pressure per square inch, we see that some provision must be made for a change of pressure in the steam passing through the meter.

Referring to Fig. 2, the pressure of steam above the valve D, and on the outlet side of the meter, may pass through the hollow valve stem E, and act on the piston H, compressing same, and the spring I, which—in the present case is of such a tension that 50 lb. pressure per square inch is necessary to overcome the statical conditions of same, and 100 pounds per square inch is sufficient to compress it to its full limit. The movement of this piston H, is transmitted to the roller A, Figs. 3 and 4—which through the bell crank b, the segment c, the pinion d, the shaft e, and the large pinion f, Figs. 1 and 3, and the rack h, transmits the movement of the end of the pointer to and from the center of the dial, showing the steam pressure per square inch on the meter. The position of the main valve stem E, is transmitted through the roller k, the bell crank l, the hollow shaft and pinion m, and the disc n, which revolves the pointer around the dial center. The amount of movement around the center depends upon the opening of the valve, and the distance of the end of the pointer from the center of dial depends on the steam pressure

per square inch between the limits of the meter of 50 and 100 lb., and, on account of the compensating mechanism, the lb. avoirdupois of steam or horsepower passing through is always indicated.

The size of the pipe and meter determines the maximum possible horsepower on the dial, while the number of the spring determines the range of pressure required. In measuring exhaust steam for heating, the spring and dial are designed to show a pressure from 0 to 30 lb. absolute, and the dial may indicate pounds of steam instead of horsepower.

The method of calibrating a meter is as follows: From the meter's construction there must always be a difference in the steam pressure each side of the meter depending on the inlet pressure; therefore, the amount of steam flowing through will regulate the amount of valve opening. As the difference in pressure between the two sides of the meter increases as the pressure increases, the opening through which the steam flows will not increase as fast as the pressure, in order to let the same weight of steam through in a certain time, and this is advantageous, because the valve will require less movement as the pressure increases. In order to calibrate the meter, it is necessary first to get a spring of the proper tension to move the end of the pointer from the outside to the inside of the dial through the range of pressure required. The spring is first calculated, then one can be adjusted when hot and in place, if necessary, by holding the outside valve stem E, and turning the inside valve stem with a socket wrench. The meter is connected up between the steam header and condenser with a pressure regulating valve in series between the meter and steam supply.

Accurate gauges are connected to both the inlet and outlet side of the meter, and the pressure regulator is set to carry the highest pressure for which the meter is calibrated. A valve on the discharge side is opened slightly, and the position of the pointer noted, and the quantity of steam flowing through is condensed and weighed. In like manner a series of points for a constant pressure is established through the whole capacity of the meter. The pressure is reduced and the operation is repeated. When completed and the points are connected, there will be a series of concentric rings representing the different pressures, and a series of converging or diverging curves representing the pounds of water passing through which is indicated by the position of the pointer when meter is in operation. The spring should be of steel, heavily nickel-plated.

President Duntley, of the Chicago Pneumatic Tool Co., has returned to Chicago from a six weeks' trip to Europe and is now making a tour of inspection of the American plants of the company. Mr. Duntley is enthusiastic over the success of the company's business in Europe. He brought back with him orders for 1,000 machines and had previously cabled orders for 300 more. The compressor plant at Franklin, Pa., has been ordered to begin overtime work in order to keep up with the demand. The new factory at Frazerburg, Scotland, was started while Mr. Duntley was there and will be running full force, with three months' orders ahead, by Jan. 1.

The Jenks Shipbuilding Co. and the Dumford Dry Dock Co. have been consolidated, and the former will move its plant from Black river to a site now occupied by the dry dock company on St. Clair river, at Port Huron, Mich. The consolidated plants will have a capacity for building any sized ship and for docking the largest boats. Port Huron citizens subscribed $25,000 in stock to assist in putting the consolidation through.

A statement to the creditors and stockholders of the Neafie & Levy Ship & Engine Building Co., Philadelphia, shows the liabilities to be $454,000 and the assets more than double that amount.

CAR AND LOCOMOTIVE BUILDING IN 1904.

Returns received from practically every car building plant in the country by the *Railroad Gazette* show that approximately 62,950 cars have been built in 1904, including cars for use on elevated railroads, but exclusive of street and other electric cars. These figures do not include cars built by the railroads at their own shops. Of the above total, approximately 60,806 are for freight service and 2,144 for passenger service; 60,955 are for domestic use, and 1,995 are for export. This is the smallest car output since 1897, when 43,588 cars were built. Business conditions looked very uncertain, at this time a year ago, with gross earnings falling off rapidly, while operating costs continued to grow higher; and in view of the recent large equipment purchases, beginning in 1898 with more than double the 1897 output, and continuing to increase until the high-water mark of 164,547 cars was reached, in 1902, it was wholly to have been expected that retrenchment would show first of all in equipment orders. A large amount of old rolling stock was overhauled and put into service at the railroad shops, supplying current needs in more or less temporary fashion, and it is only since the early part of the fall that new orders have been coming in rapidly. During the past three months, over 70,000 cars have been ordered; some ten per cent. more than the total output for the year. The majority of these are for delivery in the early part of 1905. During the year, 1,942 cars were built by three firms in Canada. The following table shows the *Railroad Gazette's* estimates for cars built during the past six years:

	Freight cars.	Passenger coaches.	Total.
1899	119,886	1,305	121,191
1900	115,631	1,636	117,267
1901	136,950	2,055	139,005
1902	162,599	1,948	164,547
1903	153,195	2,007	154,808
1904	60,806	2,144	62,950

During the year, 3,441 locomotives were built at the various locomotive plants in the country, as against 5,152 last year. This figure is officially correct and required no estimating. The number for the current year includes 95 electric locomotives. These figures do not include locomotives built by the railroads at their own shops nor orders given for repairs. It is interesting to note in this latter connection that during the past year an order was given by one of the leading railroads in the country to one of the largest locomotive builders for the repair of 600 locomotives. The following table shows figures for locomotive building for the past thirteen years:

1892	2,012	1899	2,473
1893	2,011	1900	3,153
1894	695	1901	3,384
1895	1,101	1902	4,070
1896	1,175	1903	5,152
1897	1,251	1904	3,441
1898	1,875		

Many of the great corporations of Chicago will distribute a large amount of money among their employes during the holidays. The Illinois Steel Co. decided to give all employes, where possible, a holiday on Monday following Christmas. In the four mills of the company in and near Chicago nearly 11,000 men are on the pay roll. All of these were not given a holiday as work could not be stopped, but the employes who worked were given double time. It cost the company about $40,000 to give this holiday. The Deering Works of the International Harvester Co. distributed about 4,000 turkeys among its employes. The Crane Co. made its usual liberal Christmas distribution.

The American Car & Foundry Co. advises us that the news item widely published stating that it is arranging to construct a large plant in England is erroneous.

PERSONAL.

Fred W. Bauer becomes assistant manager of the United States Engine Co., Parkersburg, W. Va., on Jan. 1.

C. M. Mendenhall assumes charge of the engineering department of the American Steel Foundries on Jan. 1, with the title of chief engineer. The following officers will report direct to him: Geo. G. Floyd, mechanical engineer; J. V. McAdam, traveling engineer; W. MacGregor, constructing engineer.

George W. Douglas, who has for some time been connected with the sales department of Rogers, Brown & Co., at Pittsburg, has been transferred, to assume the duties of a responsible position in the home office of the company at Cincinnati.

H. Schifflin has recently been made assistant manager of the mining and crushing machinery department of the Allis-Chalmers Co., with headquarters in the New York Life building, Chicago. He has been in the employ of the Allis-Chalmers Co. or some of its constituent companies continuously during the last 18 years. The manager of the mining and crushing departments is W. L. Loveland, who was appointed to that position about two months ago.

William C. Redfield, commissioner of public works in Brooklyn under former borough President J. Edward Seanstrom, who has been vice president and general manager of the Warp Twisting-in Machine Co. during the past year, will become president on Jan. 1 of the J. H. Williams Co., Brooklyn, and will take charge of the business of that company with which, prior to taking office with Mr. Swanstrom, he was actively identified for 16 years. The J. H. Williams Co., which manufactures drop forgings, was established by J. H. Williams, who died recently.

Obituary.

William Ellery Channing Coxe died at his home in Toledo, O., Dec. 17. Mr. Coxe was born in Philadelphia June 12, 1837, and for a long time was active in the rolling mill and coal business in Pennsylvania, and was an active member of the American Institute of Mining Engineers. He went to Toledo about seven years ago and until stricken by his last illness had an active business career. He was sales agent for Boyd, Stickney & Co., wholesale dealers in anthracite coal, and the Cambria Steel Co. He was also engaged in the iron commission business.

George W. Nimon, one of the eleven department superintendents of the Edgar Thomson steel works of the Carnegie Steel Co., Pittsburg, who two years ago were each given $50,000 worth of stock for long and faithful services, died Thursday, Dec. 22 at his home in McKeesport. He was born in Allegheny on Feb. 5, 1843 and became head of the pattern department of the Edgar Thomson steel works when it was built in 1874. He is survived by his widow and two daughters.

William Collins, Chicago, died Dec. 26 at his residence in that city. He was 37 years old, and since 1892 had been vice president of the Electrician Publishing Co. He was born in Suffolk, Eng., and came to the United States in 1885. He first was employed in New York and Boston, and there invented several direct current motors now in commercial use. Mr. Collins went to Chicago as the western representative of an eastern electrical paper.

Patent Taps and Hydraulic Riveters.

The difficulty of accurately crediting the pioneers in the mechanic arts is illustrated by two letters in the *Boiler Maker*. One of these refers to the tap improved by the omission of every other tooth. William T. Coles says: "Unless Mr. Echols is an old man this style of stay-bolt tap was in use before he was born. The writer used it in 1870, in the Marquette, Houghton & Ontonagan Railroad boiler shops, in Marquette, Mich. They were known then as the Prussian tap, and were made by George Bay, then employed in railroad machine shop. He is now employed by the Lake Shore Engine Works, of Marquette. How long they were in use previous to 1870 I do not know; but that they were in use at that date I can furnish ample proof. These were certainly the best taps I have ever used in my 34 years' experience at boiler making. They were very expensive taps to make at that time, as there were no machines suitable for cutting out every alternate tooth. I presume this is the reason these taps have not been in the market for the last 34 years."

The other letter is by W. J. Hageman, relative to the originator of the hydraulic riveter in the United States, and he says: "Mr. W. H. Wood cannot be the father of hydraulic riveters in America unless he comes forward with a claim prior to 1887. It has been stated that in 1887 there were but three hydraulic riveters in this country, one at I. P. Morris & Co., Philadelphia; one at William Cramp & Co., Philadelphia; and one at the Richard Hammond Boiler Works, Buffalo, N. Y., and all imported. Six years before the date when it is said there were only three imported hydraulic riveters in this country, or in 1881, Bement, Miles & Co., now the Bement-Miles Works of the Niles-Bement-Pond Co., designed, built and sold a 72-in. gap hydraulic riveter, 40 tons capacity, to the Baldwin Locomotive Co., of Philadelphia, and one of the same capacity, same year, to Robert Wetherill & Co., of Chester, Pa. Reference is made to an order for hydraulic riveters from Mr. Richard Davis, of Milwaukee, Wis., which is probably true, but it should be qualified by the fact that the equipment was Bement, Miles & Co.'s design and product. The second order referred to as sold to Mr. Joseph Bee, of Chicago, was also a Bement, Miles & Co. creation. Messrs. Bement, Miles & Co. do not know of any American concern in advance of them in the development of this particular class of machinery."

Ferro-Concrete in London.

The growing popularity of concrete construction and especially the use of the reinforced material gives interest to a recent address by L. G. Mouchel at a meeting of the Royal Institution of British Architects. The speaker is reported as saying that London enjoyed the unique privilege of being the only city in the civilized world where ferro-concrete constructions were actually prohibited. Such buildings had been erected in London, but only on land belonging to railway and dock companies. The fact had been brought to the attention of the London County Council, but they were always met with the same reply, "The act stipulates a certain thickness for walls. If you give your walls that thickness you can build." But to give ferro-concrete walls that thickness would be financially impossible and also absurd, as the comparatively thin walls of ferro-concrete were many times stronger and safer than those stipulated in the act."

The real estate and plant of the New York Agricultural Works, Somerville, N. J., were sold at receiver's sale, Dec. 8, to B. Lissberger & Co., metal manufactures of 738 East Fourteenth street, New York City, for $14,000. The works, backed by the Trench Brothers, of Chicago, were removed from Boonton, N. J., about two years ago. The Somerville board of trade gave the concern a site and $5,000 bonus. The plant was sold greatly below its original cost. Blissberger & Co. have informed the Somerville board of trade that after Jan. 1 they will establish a part of their extensive manufacturing business in that town.

The Cleveland Electric Co., after testing various kinds of air brakes for two years to determine which is the best, has awarded a large contract for brakes to the National Electric Co., Milwaukee, which is now arranging to ship several carloads of brakes to Cleveland.

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DECEMBER 29, 1904

FEDERAL REGULATION OF CORPORATIONS.

The proposals now being put forward for the regulation of corporations carrying on interstate business should give no cause of fear for the future of legitimate business. What has been happening in this country in the past half dozen years has demonstrated that government power was likely to be outstripped by two other powers that had been gathering strength in a marvelous way—corporate power and organized labor power. The cry of centralization has been raised so often and with such good effect in the years since the States rights heresy in the hideous form of secession was shot to death, that the general government has erred on the side of non-assertion of sovereignty. It was this jealousy of the exercise of federal power, even in time of great public peril, that sent up a great hue and cry when President Cleveland ordered federal troops to put down the Debs rebellion growing out of the Chicago railroad strike. And in the late national campaign, as to some extent in the campaign preceding it, a section of the press and a set of political orators sought to play upon the fear of what a strong administration might do, by raising the cry of imperialism.

And now, since the outline of a plan for the regulation of great corporations has been made public by the national commissioner of corporations, there have been some protests, based on the fear of what might happen with the wrong set of men in control of the government. Inferentially the argument against federal "interference" in corporate affairs is that the people and their elected servants are less to be trusted to provide for the common welfare than are the directors of great corporations. Such a view needs only to be stated to be ruled out of consideration. Every such argument against federal control of inter-State corporations appears to take it for granted that a policy of *laissez faire* has prevailed in the dealings of the United States with industry and commerce. Nothing is farther from the fact. The creation of the Inter-State Commerce Commission is commonly cited as the conspicuous example of legislation embodying the principle of federal oversight of corporate operations. But such oversight is peculiarly a function of government in a country that for years has been conspicuous for a fiscal policy that protected and fostered its industries. Control of what protection has built up is but a corollary of protective legislation. The great industrial operations that have resulted from protection have required immense capital for their carrying on and the evolution of corporate ownership has been rapid. In late years the rolling of corporations together in bundles has brought such swift concentration of capital that the people are confronted with a power almost rivaling the state. The question has thus been rapidly narrowing down to the alternative of the people controlling the great corporations or the great corporations controlling the people. Certainly nothing has contributed more to the growth of socialism in the United States than some of the ways in which concentrated corporate power has been used since the trust became a prominent factor in our industrial life. Concentration is inevitable and the consolidations are with us to stay, but not with all their weaknesses and worse; and the issue now is not whether they shall be controlled from without, but whether they shall cooperate with a plan that safeguards the public and does no harm to legitimate interests, or by resisting proper control lay up a reckoning that will not discriminate.

Promoters and speculators who have thrived on secrecy concerning the value of the securities they manufacture and whose trade is syndicate manipulation under "sell-my-stock-first" contracts, like that of the unsavory shipbuilding trust, may not relish government regulation of their business; but corporations willing to publish honest statements of their operations need have no fear. Federal control means the separation of the sheep from the goats. Such a sifting should have no terrors for the good "trusts."

The great body of the manufacturers and business men of the country are conservative and jealous of the faith that is at the foundation of all business success. They know well the evils that have grown up under the rapid centralization of power in the hands of the few men who largely control transportation in the United States. They recognize that the State system of incorporation is responsible for many of the evils existing today in the management of consolidation. They see that the result has been the creation of great corporations with almost unlimited power; that where state authority leaves off, federal regulation should begin, but does not. While federal charters would open the door to a flood of political abuse and corruption, there is a course open, under the federal franchise proposal, that will put the national government in position to defend the rights of individuals, with no detriment to legitimate business. It is to the shaping of such legislation that effort may well be directed. That this means centralization of power in the federal government should not be alarming; such centraliza-

tion is safer than centralization in the hands of a few heads of corporations with no accountability to the people. And that appears to be the only substitute the opponents of federal control have to offer.

RAILROAD BUYING AND THE IRON TRADE.

The compilation of the car-building record for 1904 gives striking testimony to the shrinkage in railroad buying that has been in large part responsible for the poor showing of the iron and machinery trades in the past twelve-month. It was the general knowledge that the railroads had abstained since the early months of 1903 from making new outlays for equipment, both on rolling stock and shop accounts, that led monied men of courage and insight to buy industrial stocks in the late summer and early fall of this year. The calculation was that the railroads had so long gone without iron and steel products that the wear on cars, locomotives and track would compel them, with such crops to move as were harvested this year, to make extensive investments for 1905. The argument was good and its soundness has been demonstrated in the past three months, during which car orders have been placed equal to the entire output of the car shops of the country in the year just closing. Whereas the 62,950 cars built in 1904 were only 45 percent of the average output of car works in the five preceding years, the indications are that the record for 1905 will be fully up to the average of the years 1899 to 1903 inclusive.

While certain important projects, like that of the Hudson and East River tunnels, would indicate that the policy of the railroads is far-sighted, the iron trade has had proof on many occasions that the reverse is the rule. The insufficiency of terminal facilities that led to such a breaking down of the whole transportation system of the country in 1902 has not been cured. It was only the falling off in business in the past year that made railroad facilities at all adequate; and any call upon the lines for the movement of an unusual tonnage in a limited time showed how thin was the partition between reasonable dispatch and an actual embargo. It is the habit of the railroads to take measures to extend their facilities for the handling of freight when prosperous conditions have brought freight movement well-nigh to a standstill. The trouble with the transportation lines, as with iron and steel manufacturers, is that when business is slack there seems no probability that such a volume as will cause congestion will come again. Yet the change comes almost in a night and presently a boom is found to be in full swing, with no road ready to handle the business offered it.

No one thing would more contribute to a change from the feast and famine habit of the iron trade than the pursuance of a more even and more consistent policy by the railroads in the matter of extensions and the maintenance of adequate equipment. Better than any scheme for the accumulation of stocks of pig iron to provide against wide fluctuations in prices, would be such a distribution of buying by the iron trade's greatest customer and the country's most important industrial factor, as should keep railroad work in the mills and metal working shops of the country throughout the twelve-month. The financial resources of the railroads of the country and the progress made in recent years in the direction of co-operation and community of interests, should make this no impossible program.

New Orders for Steel Cars.

(Special Telegram.)

PITTSBURG, Dec. 28.—The Pittsburg & Lake Erie railroad has placed an order with the Pressed Steel Car Co. for 1,000 steel cars. This with the order of the Pittsburg Coal Co., makes total contracts for 3,000 steel cars placed here in the week.

American Steel & Wire Co. Furnaces.

(Special Telegram.)

PITTSBURG, Dec. 28.—The Neville Island furnace of the American Steel & Wire Co. will be blown in next week, after being idle since last May. All local furnaces of the wire company will then be in operation.

Traffic Through the "Soo" Canal.

During the year of 1904 the total net tonnage of freight carried through the Sault Ste. Marie ship canals was 31,545,106. The tonnage for 1903 was 34,674,437. This leaves a balance of 3,129,331 net tons in favor of 1903. The total tonnage for December was the largest on record. It was 970,865, as against 497,198 a year ago, leaving a balance in favor of December of this year of 473,667 net tons. Grain other than wheat, shows an increase of 3 percent over last year. The tonnage in pig and manufactured iron increased 19 percent, building stone 27 percent, and general merchandise 11 percent. All other items of commerce show decreases ranging all the way from 3 to 34 percent.

Coking Coal Land Purchased.

The purchase by the H. C. Frick Coke Co. of 1,000 acres of Connellsville coking coal land has just been announced. The property bought is said to be the last piece of coal land held by private individuals in the Connellsville region. The property lies in North and South Union townships, near Uniontown, Pa., and the price paid is said to be $1,000,000. The deal includes sixty-three acres in the Klondike region and 100 ovens, known as the Crossland plant.

The charter members of the Southern Timber & Mineral Land Company met in Nashville, Tenn., Dec. 22 and effected an organization by electing A. M. Shook president, E. H. Hinton vice president, S. A. Champion general manager and A. W. Wills secretary and treasurer. The by-laws were adopted and the capital stock was fixed at $100,000. The Board of Directors consists of A. M. Shook, A. W. Wills, Benton McMillan, S. A. Champion, E. H. Hinton, John Allison and J. H. Moore. An Executive Committee was elected and is composed of S. A. Champion, Clairman; A. M. Shook, E. H. Hinton, Benton McMillan and A. W. Wills. It was decided to make all necessary preparations and proceed at once to business. It is understood that the concern will have Eastern and Western connections that will make it a strong financial institution. The offices will be in the Vanderbilt Building, Nashville, for the present. President Shook was formerly with the Tennessee Coal, Iron & R. R. Co.

The Labor Situation.

THE YEAR FROM THE MOLDERS' STANDPOINT.

The *Iron Molders' Journal* for December reviews the relations of the union with foundrymen in the past year, and summarizes the results of the depression in business as it affected the Iron Molders' Union. We quote from the article as follows:

"One of the first fruits of the depression that seemed to exist was a request from the Stove Founders' National Defense Association that a 15 percent reduction should be granted by the Iron Molders' Union. At the annual conference between the two associations, held in Chicago the middle part of March, the matter of a reduction was fully discussed, and though the stove foundrymen were somewhat dubious of the future, it was finally agreed that the percentage paid in 1903 should prevail for 1904. Happily the fears expressed by these foundrymen were not realized and the volume of business transacted during the year has been of a satisfactory character in this branch of the trade, many firms having operated their foundry with a full force during the year.

"In the jobbing and machinery branch conditions were not so satisfactory, reductions were demanded by many of the foundrymen, and in addition to this another factor was introduced. The National Founders' Association drew up a set of clauses covering the questions that had arisen in the past with the exception of hours and wages, and in addition providing for what has been termed the "open shop." As the yearly agreements held with members of this association expired, the foundrymen, in addition to their demand for a reduction in wages, insisted that the substance of all the clauses contained in their form of agreement should be incorporated or they would refuse to enter into any agreement whatever, and as all members of this association were advised by their officers to sign no agreement that did not contain these clauses, but few were entered into during the year.

"A national conference was held between representatives of the two associations in April for the purpose of endeavoring to formulate an agreement that would be specific in its terms and general in its application, but the provisions desired by the N. F. A. were of such a character that the molders' representatives were unable to agree to them, and the conference adjourned without having accomplished the object for which it was called. Local conferences were afterwards held in Indianapolis, Ind.; Cleveland, O.; Pittsburg, Pa.; Worcester, Mass.; Chicago, Ill.; Milwaukee, Wis.; St. Louis, Mo.; St. Paul and Minneapolis, Minn.; Cincinnati, O., and other foundry centers, for the purpose of reaching local agreements for the coming year. The obnoxious and one-sided form of standard agreement adopted by the N. F. A. was introduced in every instance and no local agreements were reached. As the molders working in these cities refused to accept a reduction on the minimum, and were supported in their position by the executive board, they were able to maintain the minimum paid in 1903 during 1904, and Worcester, Mass., and Cincinnati, O., were the only cities where some of the foundrymen forced the issue of a reduction on the minimum, while in Utica, N. Y., the heater shops forced a reduction of 20 percent on board prices. Our members were forced to take issue, however, on other questions in certain localities, the molders working for the Westinghouse Co., of Cleveland, striking against the introduction of the premium system, and the molders of St. Louis, Mo., against the introduction of the piecework plan.

"Many local strikes occurred through the action of individual foundrymen, who endeavored to take advantage of the depression for the purpose of introducing changes that were not acceptable to the molders. While the depression did not make itself felt to any degree in the stove industry, it seriously affected the jobbing and machinery branches, and the 100,000 out-of-work stamps issued during the year bear silent testimony to the extent of idleness that affected our members. The loyal spirit shown by the members, however, enabled them to keep their organization intact, and the value of the Iron Molders' Union as a protective organization was demonstrated as never before, and while it assisted the molder it proved also of great value to the foundrymen, as it prevented to a large degree the ruinous competition that was a feature of previous depressions. As the year closed, the New York Agreement passed into history and the official relations that have previously existed between the N. F. A. and the I. M. U. of N. A. have been altered by the action. The future alone can point the way to a better and more equitable method of considering the disputes that arise."

PREMIUM SYSTEM IN BRITISH FOUNDRIES.

The bonus or premium system is opposed by union molders in England and Scotland. A news paragraph in an English trade paper says that the secretary of the Friendly Society of Ironfounders [the name of the iron molders' union] announces that the English and Scottish Societies have decided upon an alliance under which both societies agree to boycott the bonus or premium system. Under the agreement, whenever the system is introduced into any molding shop, it must in every instance be opposed.

MILWAUKEE FOUNDRYMEN'S ASSOCIATION.

The Milwaukee Foundrymen's Association held its annual meeting and dinner Dec. 19, at the Plankington House, forty-four members and guests attending. The following officers were elected: President, A. J. Lindermann; vice president, W. J. Turner; treasurer, Clarence Falk.

Prof. John H. Gray, of Chicago University, responded to the toast "The Labor Situation in Europe." Prof. Gray has just returned from a European tour and is familiar with the conditions upon which he spoke. Hon. Charles Quarles talked on "The Closed Shop;" O. P. Briggs, commissioner of the National Foundrymen's Association, on "The Year's Work of the National Foundrymen's Association and the Labor Situation in the United States;" President Walter Read on "The Work of the Milwaukee Foundrymen's Association for 1904," and W. J. Fairbairn, secretary, on "The Employment Bureau of the Metal Trades Association." There were five minute talks by members of the association.

MACHINISTS ASSAULTED.

Another assault case has been added to the long list of slugging affairs connected with the Chicago machinists' strike, when three non-union employes of the Goss Printing Co., reported to Attorney Dudley Taylor of the Chicago Employers' Association that they had been attacked at Grand avenue and Carpenter streets by union pickets. Samuel Mooy and John McWhinnie, union machinists, were arrested on charges of complicity in the affair.

Thirty-three members of the Chicago Machinists' Union have been ordered to show cause why they should not be held in contempt of court for violating an injunction issued by Judge Brentano prohibiting them from picketing the plant of the Goss company.

WAGES OF STRUCTURAL WORKERS.

A new wage agreement for 12,000 bridge and structural iron workers throughout the United States has been decided upon by the executive committee of the International Association of Bridge and Structural Iron Workers, which has been in session in Chicago for the last ten days. The scale provides for 35 to 45 cents an hour, according to locality. In some districts the new scale provides an increase, while in others it is about equal to the present pay. In the Chicago district, where a rate of 45 cents an hour has been decided

upon, the states of Illinois, Indiana, Ohio, Missouri, Kansas, Wisconsin, Minnesota and Michigan are included. Members of the committee said that all employers would be asked to sign the agreement and that strikes would be called wherever this request is refused.

MORE VIOLENCE AT NEWPORT, KY.

Following the attempt to blow up the Newport Foundry & Machine Co.'s plant in the night of Dec. 23, five of the strike breakers were attacked by a large crowd of union sympathizers. Martin Bauries, one of the non-union men, was beaten into insensibility and one of the strike sympathizers was cut with a knife.

METAL TRADES ASSOCIATION NOTES.

CINCINNATI, Dec. 27.—At the meeting of the superintendents and foremen of the Chicago Metal Trades Association held at the Sherman House Dec. 17, the Metal Trades Superintendents' and Foremen's Club was formerly organized, and the following officers were elected to serve for the ensuing year: President, C. E. Davis, with the Goodman Manufacturing Co.; vice president, L. I. Yeomans, with the Link-Belt Manufacturing Co.; treasurer, C. E. Finkle, with A. Finkle Sons' Co. The following were chosen as the executive committee: G. D. Wiggins, with the Link Belt Machinery Co.; H. A. Wainwright, with the Sullivan Machinery Co.; Charles Smolar, with the Weir & Craig Manufacturing Co., and Harry Slater with C. F. Elmes Engineering Works. Invitations to the above meeting were sent only to foremen of such concerns as furnished a list of their superintendents and foremen. There is no doubt that this organization will prove to be of mutual advantage to the members and their employers.

The labor situation in the shops of the members of the St. Louis Metal Trades Association is quiet, with the exception of a few instances where efforts are being made by union agitators to organize the shops. Several cases have been brought to the attention of Secretary Leigh of the association, where union men have made it so disagreeable for non-union men that the latter were almost tempted to resign their positions. The association immediately took vigorous measures to stop molestation of working men, whether by union or non-union employes.

The four foundries in St. Louis affected by the strike of the molders are now running with a full quota of men.

The labor bureau of the Boston Metal Trades Association reports a decided improvement in business. The next meeting of this association will be held at the Trade Club, Wednesday Eve., Dec. 28. Mr. George H. Ellis, president of the United Typothetae of America, will givet a review of the labor conditions in the printing trade, and the manner in which recent difficulties were settled.

H. C. Hunter, secretary of the New York Metal Trades Association, has been named temporary chairman of the proposed organization of Eastern secretaries of labor bureaus, and has invited Commissioner Eagan of the National Metal Trades Association to be their guest at the dinner which is to take place the latter part of next month. Their organization will be composed of the secretaries of labor bureaus operated by the metal trades in the following cities: Boston, Worcester, and Springfield, Mass.; Hartford and Bridgeport, Conn.; Trenton, N. J.; Philadelphia and Pittsburg, Pa., and Syracuse, N. Y.

The weekly bulletin of the Cincinnati Metal Trades Association advises its members that there is an organized movement against its labor bureau on the part of union agitators. Fifty-three members were present at the recent meeting of the foremen employed by the members of this association.

Ten of the twelve foundries which were originally affected by the molders' strike in Cincinnati are now being successfully operated with non-union men.

H. G. Frech, assistant secretary of the Cincinnati Metal Trades Association, states in his weekly letter to members under date of Dec. 24: "At this time I believe it advisable to call the attention of our members to the work which is being so successfully accomplished by the National Metal Trades Association, especially so since it is unquestionably a fact that if we can induce all of our members to become members of that association it will increase the strength and position of our own association."

W. P. Eagan, commissioner of the National Metal Trades Association, advises Secretary Robert Wuest, that he will spend the holidays and the month of January in the East. Mr. Eagan's efforts in this territory so far have been gratifyingly successful. Meantime Secretary Wuest has been successful in increasing the membership of the Association by effective work through the Cincinnati office.

The first issue of the *Open Shop* is in the hands of the members of the N. M. T. A. this week. This number is unquestionably one of the strongest yet put out, and the editor, Mr. Wuest, has every reason for pride in the magazine which he has fostered and developed to the present high level of excellence.

LABOR NOTES.

The union iron molders of the Chandler & Taylor Co., Indianapolis, Ind., have gone on a strike on account of objecting to a foreman. President Taylor, of the company, says that only a few men have gone on strike and their places are being readily filled. The company has long been known as operating an open shop.

At the Wharton blast furnace, Wharton, N. J., 52 men have gone on a strike for an increase of wages from $1.55 to $1.75 per day.

The Inland Steel Co., Indiana Harbor, Ind., has given notice that it will open its sheet mill Jan. 1 and will employ 300 men under open shop regulations. No union men will be accepted. Wages will be paid commensurate with the ability of each man. The company desires a personal interview with each man who seeks employment. The mills have been closed since last July, when 300 men went on strike.

By agreement the temporary injunction granted the striking employes of the Bates Machine Co., Joliet, Ill., has been made permanent, and the damage suit against employes has been dismissed. This action, which probably marks the close of the bitter struggle between the Bates Co. and the machinists, was taken a few days ago.

A committee of two members of the Amalgamated Association of Iron and Steel Workers asked for a conference last week with general manager I. W. Jenks of the American Steel Hoop department of the Carnegie Steel Co. for the purpose of discussing a possible settlement of the strike. A conference was refused as the company refuses to deal with the men as employes. The Youngstown mills are operating in full and are now lost to the association.

The Janson Steel & Iron Co. has decided to remove its plant from Oxford, N. J., to Columbia, Pa., where it expects to employ, at the start, about 300 men. The company has decided to use only such machinery from the old plant that is modern. The balance needed will be purchased new, and the company will be in the market for new machinery such as boilers, engines, pumps, heaters, etc.

The Buckeye Wheel Co., Galion, O., has been incorporated by John W. White, W. A. Morris, Edward Flickinger, Jacob Keene. Capital, $150,000. The new company succeeds the Flickinger Wheel Co., closed some time ago on account of financial troubles. The old plant has been remodeled and started this week with 250 employes.

CANADIAN INDUSTRIAL NOTES.

TORONTO, Can., Dec. 27.—The Canada Car Co., announcement of which has already been made in *The Iron Trade Review*, has elected as president and general manager, W. P. Coleman, ex-vice president of the American Car & Foundry Co., and Sir H. Montagu Allan, vice president. The capital consists of $2,000,000 common and $1,000,000 preferred stock, the former being all subscribed and paid up, while so far about one-half of the preferred stock has been paid up. The works will be located in Montreal, the company having acquired about 50 acres on the bank of the Lachine canal, which will be practically all occupied. The foundations have been completed and it is anticipated that the structural steel work will be commenced by May and the works completed ready for operation by Aug. 1. One building will be over 1,000 ft. in length and from 300 to 400 ft. in width. The complete plant will comprise three or four groups of buildings. The works will have a capacity of 25 complete freight cars per day and 12 passenger coaches per month. At the outset some 1,500 hands will be employed. In place of the usual reciprocating engine the turbine system will be adopted. This will be its first introduction into Canada. It is intended to effect a notable saving in the cost of fuel by using principally wood refuse and shavings in the boiler rooms. The Canada Car Co. has already secured a contract from the Grand Trunk to supply a large number of freight cars, the figure stated being 15 cars per day for five years. The establishment of the company is the direct outcome of the Grand Trunk Pacific undertaking.

The Steel Radiator Co., Ltd., has been granted a provincial charter of incorporation with a capital of $500,000 and head office at Toronto. The provisional directors are Clarence E. Safford, of Buffalo; James G. Smith, Neil Sinclair, Frank Morison and Strafford Watson, all of Toronto.

The Atikokan Iron Co. has for some time been carrying on test work on the Atikokan iron range where, in the opinion of experts, the deposit is one of the finest on the continent, being of Bessemer quality. It is estimated that there are 5,000,000 tons of ore in sight. Development will shortly be begun. Some delay has been caused in the plan of operation by negotiations with the Canadian Northern Co., whose main line to Port Arthur taps the iron range. The iron company desires to arrange for the construction of a spur line for a distance of three miles into the mines with ore and coal docks on the lake front. The Canadian Northern is not anxious to undertake this until the iron company begins the erection of a furnace which will probably be built at Fort William. The arrangements with the railway company are now nearly concluded. Hugh Sutherland, executive agent of the Canadian Northern, is visiting some of the furnaces in the United States to ascertain upon what basis the undertaking could be made successful. In January he will make an inspection of some of the plants in Pittsburg to secure all the information possible.

The Wilkinson Steam Turbine.

The Wilkinson Turbine Co., of Birmingham, Ala., describes the Wilkinson steam turbine as of the impact multiple-stage type. Diaphragm partitions divide the interior of the turbine into several compartments or stages in each of which there is operated a bucket wheel firmly attached to a common shaft. A number of passages admit the supply of steam to the first stage and similar openings admit the steam through the diaphragm partitions, causing it to impinge against buckets on the wheel in each stage. The full energy of the steam is abstracted fractionally and in equal parts for each stage, thereby giving to each bucket wheel the same power and velocity. The controller mechanism being adapted to open and close the nozzles successively as the load on the turbine increases or decreases, will act to supply steam to the turbine at varying loads.

The Wilkinson turbine, following its principles of construction and operation, has been adapted to reversing by the provision of a second row of buckets, mounted upon the row of buckets directly secured to each wheel. In this manner the bucket wheels have two peripheral rows of buckets superimposed one on the other, the outer row being reversely disposed to the other set of buckets and adapted to receive the steam from a different direction. In order to obtain a reduced speed at full efficiency the turbine has been provided with a third set of buckets mounted upon the head blocks of the outer or reversing buckets above mentioned. The buckets of this third set are arranged in two parallel rows which have between them a row of stationary guides or intermediates attached to the casing. A third set of valved nozzles control the supply of steam to this outer set and the steam is abstracted by twice as many rows of buckets as when it is flowing through either of the inner sets of nozzles and buckets.

The Annealing of Crucibles.

The following suggestions are offered and will be found perfectly expedient in every brass foundry:

Unpack the crucibles and place as many of them as possible on the flues back of the furnace. Here they will be heated to a sufficient degree so that they cannot be handled without burning the fingers. They should be left in this position from one to three weeks.

At midnight, after the fires are drawn from the furnace, and the furnace is allowed to cool for, say, fifteen minutes, open the furnace wide, lay a shank across the top, place a crucible on the shank (mouth down) over the center of the furnace so that the remaining heat in the furnace will come up during the night and strike not only the inside but also the outside of the crucible. Repeat this three or four times.

Draw the fires as before, allow the furnace to cool twenty to twenty-five minutes, place the pot (mouth down) on the grate bars of the furnace, allow it to remain all night. Repeat this the second night, only giving the furnace ten or fifteen minutes to cool off. Repeat again the third night, and this time leave the cover on the furnace.

By this method a crucible will be brought up to a red heat slowly and gradually, and whatever moisture may have been within the walls will be expelled without any steam. It is the expansion of the moisture and the generation of steam which blows a piece, or flakes off the pot.

Some foundrymen will say that so much annealing is unnecessary; that they have followed a different practice for twenty years and have had very little trouble. The answer to this is: Scalps are not of frequent occurence, and it might be a year or two between troubles of this kind, but when they *do* occur they are expensive. It is not every shipment that gathers moisture. We have seen crucibles taken out of the cask and immediately put into the fire without detrimental results, but the user is assuming considerable risk in so doing

As an evidence that this "flaking off" is caused by moisture, we would say: Nobody ever saw a crucible scalp after it had safely gone the first heat, which is proof positive that the bringing of the crucible up to the heat necessary to melt brass, expels from it *all* the moisture, consequently after the *first* heat there is no danger of a scalp.—Dudley A. Johnson, in Graphite.

The Cleveland Twist Drill Co., Cleveland, has been incorporated by J. D. Fox, F. F. Prentiss, W. C. Cochran, Eugene C. Peck, Witt. Kast. Capital $1,000,000. The incorporation does not in any way change the control or policy of the concern, which has long been owned by Messrs. Cox and Prentiss and operated as a firm, though with a company name. The incorporators and possibly several others will become stockholders in the company.

VARIABLE SPEED MOTORS.

Modern machine shop practice approves the electric drive in one form or another, but the selection of the motor and means of speed control as well as the method of power transmission to the material worked are subjects for individual determination. The latter feature comes directly within the province of the machine tool builder. Difficulty in securing suitable speed gradations by purely mechanical means early created a demand for a variable speed electric motor. The Crocker-Wheeler Co. of Ampere, N. J., developed a system of multiple voltage equipment for this purpose which is well known. There are, however, many small shops, isolated tools, etc., where the speed requirements are limited and consequently the installation of a complete variable speed system would not be warranted. The Crocker-Wheeler Co. now offers a complete line of variable speed motors, for single voltage circuits, in which the speed variation is obtained by field regulation alone. The general design of these motors adapts them readily to machine tool application, the frames are compact and neat and afford ample protection to the moving parts and provide for easy access and proper ventilation. The bearings are of the ring oiling type, thoroughly protected from the intrusion of dust and dirt. The pole pieces are cast steel. The coils are carefully wound and insulated, the outer surface being covered with stout insulation coated with varnish. These motors are arranged in two classes, the first being adapted to give constant horsepower throughout a speed range of 2 to 1, and the second being arranged to give a constant horsepower throughout a speed range of 3 to 1. Both of these classes are designed for operation on a single voltage of either 115 or 230 volts.

In order to adapt these motors more thoroughly to the requirements of the machine tool builders, the classes are divided into two groups, the group comprising the smaller sizes of motors being designed to operate at a maximum speed of 1,600 r. p. m., and the group comprising the larger sizes at a maximum speed of 1,400 r. p. m. The advantage of having the motors thus grouped as regards speed ranges will readily be appreciated by the tool builders, as they are thus afforded a choice in the power of the motor which may be applied to a given tool without the necessity of altering their speed mechanisms to suit the varying speeds which are usually involved in a change of motors. For use with these motors the manufacturer generally supplies full reverse controllers of the drum type, which are used for starting the motors and for weakening the fields up to maximum speed.

Eastern Pig Iron Association.

The organization of the Eastern Pig Iron Association at a recent meeting in New York City, as given in our last issue, was the outcome of the informal meetings Eastern blast furnacemen had been holding for some time to discuss matters of mutual interest. The new association, it is stated, has nothing to do with any effort to fix prices and members will not be bound to maintain quotations, each being free to act in these matters without reference to others. It is expected, however, that by an exchange of information, especially as to the condition of order books, a more uniform policy with regard to sales may be adopted. An effort will be made to correct some of the abuses now existing, both in regard to receipt of raw materials and to the demands made by customers regarding conditions of contracts and for concessions on stipulated deliveries and prices in a falling market. The furnacemen have what they regard a just grievance in the matter of coke deliveries, some of them being compelled to go into the market to purchase supplies, although covered by contracts. It is claimed that coke sellers, short on deliveries, have offered spot coke at higher prices to furnaces other than those to which deliveries were due. The question has arisen whether in the purchase of each other's coke in this way furnacemen have not had something to do with advancing prices. The policy of refusing to buy from coke producers who are already behind in deliveries has been suggested.

All the companies that have thus far joined the association are sold up for several months and there is no disposition to advance prices above the present level. The general sentiment is conservative, the desire being to keep prices within reasonable limits rather than to force them up for brief periods followed by hurtful reactions. Monthly meetings of the association will be held, alternating between Philadelphia and New York.

Eastern Pennsylvania.

HARRISBURG, Pa., Dec. 28.—Industrial operations in this part of the Keystone State are in contrast with those in Western Pennsylvania to the extent that there is no interruption from shortage of water supply. Orders are reported to be plentiful and there is no lack of business in sight for the first quarter of the new year.

In this city every plant has been in operation and there is only one idle blast furnace in Dauphin county. Barring the Lackawanna group, few are idle in the valleys of the eastern part of the State. The mills hereabouts shut down only one day for Christmas, and railroad shipments have been large and give promise of continuance.

While the mail orders placed with works in this part of the State are not large there are hopes of more. The Pennsylvania Steel Co. is running its mills regularly and doing a big bridge business.

Up the Juniata and Susquehanna valleys there is a great shortage of water which has compelled mills and furnaces as well as railroads to curtail hours of work and to husband water supplies.

The Logan Iron & Steel Works may be started soon. A sale of the plant under legal auspices was a step toward rehabilitation.

The Fleetwood Foundry & Machine Works at Fleetwood was burned with loss of $12,000. The entire plant was more or less damaged.

Lancaster county's situation is improved by the starting of some idle mills and the reported removal of the Jansen Iron Co. from New Jersey.

York County Argricultural Works have taken several orders for engines and machinery for the Transvaal and Egypt. These works have been gaining in African trade and are doing a fair business in South America.

The outlook for the new year is improving every day and manufacturers are confident of a big gain in business over 1904, which will be remembered as one of the most peculiar in years in these parts. Works had alternate periods of activity and depression.

The Pittsburg Coal Co., Pittsburg, has placed an order with the Standard Steel Car Co. for 2,000 steel cars. Of this number 600 are intended for the Monongahela Coal & Coke Co. The cars are to have a normal capacity of 90,000 pounds and an overload capacity of 100,000 pounds.

The remaining five mills of the South Sharon, Pa. tin plate works of the American Sheet & Tin Plate Co. were placed in operation this week. This is the first time since this plant was built that the entire twenty mills have been in operation.

None of the mills in the Pittsburg district have shut down over the holidays to make annual repairs, owing to the heavy demand for all kinds of iron and steel products. The Shenango works at New Castle, Pa., is the only steel plant that will remain idle this week. It will resume operations next Tuesday.

TESTS OF SOLDERS FOR STEEL BRAZING.

The assistance of the National Physical Laboratory was recently asked on behalf of a skilled workman, E. Parsons, of Birmingham, who was having difficulty in the brazing of steel joints. Samples of the solder, the steels, and the borax were sent to the laboratory for test. Chemical analyses showed that there was nothing abnormal in the composition of the steels, and that the borax was of remarkable purity. The analysis of the solder was as follows:

	Percent.
Copper	52.53
Zinc	45.46
Lead	1.35
Iron	0.42
	99.76

Five samples of commercial steel-brazing solders were supplied to the laboratory through the kindness of Messrs. Heaton & Dugard, Birmingham, and the following tests were carried out:

The brazing qualities were tested, both as regards iron and steel, by Mr. Parsons. In this case heating was performed in an ordinary smith's hearth. Attention was paid to the three leading particulars of temperature, ease of flushing, and tenacity. The last named quality was tested by breaking the brazed joint with a hammer.

Two series of brazed joints of good quality mild steel (0.3 to 0.35 carbon) were made in the factory of the Birmingham Small-Arms Co., Ltd., the brazing being done with blow pipe and gas. One series of joints was tested at the works by breaking them with a hammer; the other series was broken by tension in the testing machine at the National Physical Laboratory.

Complete analyses of the solders were made in the chemical department of the laboratory. The results are tabulated in the two accompanying tables.

Although five solders have been under examination, the chemical analyses show that the compositions of Nos. 2, 3, and 4 are so similar that it must be admitted that only three types have been tested. This fact is brought into prominence in the table. Solders Nos. 1 and 5 occupy the same positions in each test, the former at the top of the scale, the latter at the bottom of the scale; whereas Nos. 2, 3 and 4 vary their relative positions somewhat.

The National Physical Laboratory tests are the only ones for which a numerical value of the tenacity of each brazed joint can be given, and these do not permit of a distinction being drawn between Nos. 1 and 3.

No. 5 is markedly worse than any of the other joints.

No metal, even in traces, other than those given in the table of chemical tests, was found in the solders.

The test shows that:

1. The higher the copper content, the better is the solder.
2. Solders 1, 2 and 3 are satisfactory.
3. Solders 4 and 5, and especially the latter, are unsatisfactory, both because they fuse at too low a temperature and do not give a strong joint with steel. There is no obvious reason why solder No. 4 should not be as good as Nos. 2 and 3.

Comparing the chemical composition of the solder quoted at the head of the paper with those of Nos. 1 to 5, it will be seen that the copper content is sufficient to permit of the solder being satisfactory for iron and steel brazing, but that the percentage of lead is considerably higher than that of No. 5, the highest of the series, and that there is a notable amount of iron.

The presence of lead in solder will certainly lower the temperatures of the range of fusion, and this fact will tend to make it less satisfactory.

CHEMICAL TESTS

Number of Solder	Copper	Zinc	Lead	Tin	Total
	per cent.	per cent.	per cent.	per cent.	per cent.
1	53.19	36.31	0.65	Absent	100.15
2	51.84	47.71	0.69	Trace	100.23
3	51.54	47.48	0.84	"	99.86
4	51.39	47.87	0.86	"	100.12
5	49.76	49.16	0.98	"	99.90

The iron, which has probably been introduced by stirring the molten solder in manufacture with iron rods, and which was present, at any rate partly in the form of dirt, will certainly have a detrimental influence, for it will hinder the solder from flushing completely, and it will prevent the formation of a clean joint.

RESULTS OF TESTS.

Work's Test	National Physical Laboratory's Tests		Skilled Workman's Tests				
					Tests on Steel ‡		Tests on Iron §
Order of Satisfactoriness as Judged by the Hammer Test	Number of Solder	Tons (Avoirdupois) to Produce Fracture per Square Inch of Brazed Surface	Number of Solder	Behavior on Fusion	Flushing	Tenacity	Flushing	Tenacity
Number 1	1*	4.26	1	Fairly high melting range (highest of series)	Good	Good	Good	Good
" 2	3*	4.19	2	Moderately high melting range	"	"	"	"
" 4	2†	4.13	3		"	"	"	"
" 3	4†	3.94	4	Low melting range	"	Fair	"	"
" 5	5†	3.30	5		"	Bad	"	"

*In these two cases fracture took place across the test piece, at the end of the brazed joint. † In these three cases the brazed joint was stripped from end to end. ‡ The steel was placed inside the fire. § Heating was performed on the top of an open fire.

The influence of lead and iron in solders of this type, as regards their application to steel brazing, seems to be a suitable subject of further research.—[Engineering.

Ernest A. Lewis, 310 Dudley road, Birmingham, England, in a recent letter to *Engineering*, comments on the above as follows: The percentage of lead in a good brazing solder should not exceed 0.4 percent. For making brazing solder, spelter containing about 99.5 percent zinc, and best select or electrolytic copper, should be used. The best solders, Nos. 1, 2, 3, 4, and 5 have evidently been made of spelter containing 1½ to 2 percent of lead. The percentage of iron in the solder quoted at the head of the paper has more probably been introduced by the solder being pounded in an iron mortar, as is usual in some works, than through stirring the molten metal with iron rods—that is, of course, assuming the solder to have been sent to the National Physical Laboratory in powder, and not in an ingot. If the test solders Nos. 2, 3, 4, and 5 had been made of the purest commercial metals, so as to have contained not more than 0.3 percent lead, they would have given as good practical and tensile tests as No. 1. It is interesting to note in connection with this subject that a brass flange containing 2 percent lead will not braze satisfactorily, and brass brazing solder containing equal parts of copper and zinc, if it contains 1 percent lead, does not give a satisfactory joint. The lead appears to separate out and weaken the metal.

The Best Foundry Co., Cleveland, has been incorporated with a capital of $50,000.

LAKE SUPERIOR IRON MINES.

The Cleveland-Cliffs Iron Co.'s total shipments this year have been 1,226,125 tons, against 1,309,648 last year. For 1903 the company is here given credit for all Negaunee mine shipments. For each year it is not credited with any of the business of the Lake Superior and Regent groups, though it owns a minority of stock in each. Its Ashland has shipped this year 341,000 tons, against 244,000 in 1903. The Ishpeming group fell off a little and the Negaunee materially from the full season of 1903.

The Sellwood group of mines, all but Sunday Lake and Brotherton, being on the Mesabi range, have shipped ore this year to the amount of 766,804 gross tons. This is in comparison with 900,140 last year. Then the Chester, Marquette range, and Croxton, Longyear and Pearce, Mesabi range, were operating. Leetonia, Cyprus and LaRue have this year exceeded their records of 1904. Leetonia is equipped for a big shipment if considered desirable. Mr. Sellwood has charge also of the International Harvester mines and these have shipped 244,000 tons this year, of which Baraboo has produced 50,000. It is now mining about 5,000 tons a month for Chicago furnaces.

The building of a new shaft at the Cleveland-Lake mine, Ishpeming, Mich., which was begun about 18 months ago, has been completed. The new shaft is about 400 ft. deep and is so constructed that the skips operate in a balance and the cage is managed separately from the hoisting skips. It is probable that the old shaft will be continued in operation until the first of the year, or until everything is found to be in just the condition desired at the new plant. At the present time a steam shovel is at work making additional stock pile room. A feature of the construction of the new shaft is that a tunnel is built from the lake bottom to the shaft for the purpose of facilitating the handling of timber. The old engine house will probably be dismantled in the spring.

Pickands, Mather & Co., of Cleveland, have taken an option of the St. Clair iron property that lies two miles east of Biwabik on Embarrass lake, and the prospective new lessee has given a contract to Cole & McDonald to make tests. Five drills have been put at the work. The terms of the option have not been announced, but the deal is one of considerable importance, as it is reliably stated that George A. St. Clair, of Duluth, who controls the land, has shown up about 5,000,000 tons of high grade ore. The acceptance of the mine will depend upon the result of the tests.

Alexander Maitland, manager of mines for the Republic Iron & Steel Co. and the lieutenant governor-elect of Michigan, is interested in a gold mine in the northern Black Hills, of South Dakota. The mine for the past 12 months has produced about $315,000. Mr. Maitland states that he is simply getting into shape for a large production. He has a mill and cyanide plant, all his rock going through the cyanide tanks. This is one of the most business like properties in the Black Hills. Mr. Maitland is preparing the Antoine Ore Co. properties of the Republic company near Vulcan, Mich., for more active iron mining another year, and will install a large new machinery plant at the group. These mines are producing a lean Bessemer ore that is valuable for a Mesabi mixture and mining can be done at a small cost. The Vulcan Silica may be opened next year, but the Keel Ridge will be idle for another year at least. A second crusher may be put in at Antoine, and a new compressor plant is under consideration also.

The labor commissioners' report upon the mining industry in Minnesota shows that over 90,000 men were employed in 1903 in the mines of the Mesabi and Vermillion ranges. The report deals with 47 mines on the Mesabi range and five mines on the Vermillion range. The greatest number of men employed on the Mesabi was in July, 7,031; in February the number averaged 2,500.

The Crystal Falls, Mich. officials of the Oliver Iron Mining Co. have received orders to erect a shaft house over the new shaft of the Mansfield mine, install boilers, unwater and start mining ore. The old shaft house will be moved to the new shaft. It was erected in 1897 and is in good condition. As soon as the water is out, the work that remains to connect up the new shaft with the ore body on the bottom will be completed with haste and mining will be begun.

The Winnifred Mining Co. with mine at Hibbing, Minn., has abandoned the property, which has reverted to the fee owners. The shipments have been 39,179 tons in 1903 and 81,687 this year—total, 120,866 tons. Just now the Oliver Iron Mining Co. is testing the ground looking for an extension of the ore body. The Winnifred company had a minimum royalty to pay in advance and did not think it worth while to pay it, when there was not more than half enough ore in the pocket the company had been mining to pay for it. This is the smallest ore pocket ever opened into on the Mesabi range. The company is exploring its Laura ore body from which no shipments have been made this year, and is developing quite a mine there. Laura has shipped one year, 16,453 tons.

The new shaft house that has been under erection at the Blue mine, Negaunee, Mich., for the past two months, is one of the finest wooden structures in the Marquette district, with dimensions comparing most favorably with any wood head frames in the region. The shaft is provided with double skips and cages, working in balance, with cages set directly above the skips, so that both work together and all the time. The cages will be used only for handling men, supplies, etc., all ore coming up in skips, as is common on Lake Superior.

The Leonard mine's shipments for its first full season were 151,953 tons; last year it produced 10,591. Stripping has been under way there steadily all summer and is still in progress, but will cease in a few days, to be begun again in March. The mine should make a production next year of up to 500,000 tons, that being the figure set by its lessees for a steady production. It is extensively developed for a milling property and the past summer a Thew shovel was working in the pit, loading ore into tram cars on a belt line for delivery at the shaft pocket. The mine contains a total tonnage of about 8,000,000 tons of good ore.

Frank L. Strong, Manila representative of several machinery manufacturers of the United States, recently secured a number of orders for machinery to be used in the equipment of the Coast Guard machine shops on Engineer Island P. I. The machine tools are all from the Niles-Bement-Pond Co., while the power plant will be equipped by the Allis-Chalmers Co. Mr. Strong has also secured an order from the Government for a large Gates stone crusher.

Bulletin No. 9 of the University of Texas Mineral Survey is a pamphlet of 120 pages entitled "Report of a Reconnaissance in Trans-Pecos Texas." It is prepared by Geo. Burr Richardson and his work was carried on in pursuance of a plan of co-operation between the University of Texas Mineral Survey, Dr. Wm. B. Phillips, director, and the United States Geological Survey. The reconnaissance was undertaken primarily to determine the conditions of occurrence of underground water.

We are advised that the newspaper report that W. F. Burdell, H. A. Lanman and other Columbus business men have purchased the rolling mill of the Independent Rolling Mill Co., at Cuyahoga Falls, and will dismantle the plant and move it to Columbus is erroneous.

The Whitaker Mfg. Co., Chicago, has just completed moving to its new quarters, 50 and 52 S. Canal street. The present location is in the heart of the machinery district. The shipping facilities have been greatly improved.

TRADE PUBLICATIONS.

Nothing in the line of rolling mill machinery is omitted in the handsomely illustrated catalogue issued by the United Engineering & Foundry Co., Pittsburg, containing 205 pages with an illuminated cover. So extensive is the representation of machinery and equipment that 181 illustrations are required to show the various types. The United Engineering & Foundry Co. is a consolidation of the Lincoln Foundry Co., Frank-Kneeland Machine Co., Chilled Roll Foundry, Lloyd Booth Co., and McGill & Co. The introduction briefly states that the consolidation of these plants was considered wise business policy, for the reason that duplication of designs, patterns, and chemical and metallurgical investigation could be avoided, and at the same time the efficiency of the united plants be increased. Each department is today under the same shop management as before, while the engineering and sales departments are consolidated in offices in the Farmers Bank building. A few pages are devoted to illustrations of the company's various works, offices and shop practice, the remainder of the book being devoted to views of the various types of rolling mills, shears and miscellaneaus machines required in rolling mill practice. On the whole the catalogue is one of the most complete of its kind ever issued and will be of great value to all associated with the manufacture of iron and steel.

The National Founders' Association sends out a pocket size pamphlet containing the new "policy" of the association as embodied in the resolutions adopted at the recent Cincinnati convention. A companion pamphlet entitled "As Others View It" reprints the editorial comment of three journals on the departure involved in the action taken at Cincinnati.

A booklet of the Berger Mfg. Co., of Canton, O., under the title "Ye Olden Time Charcoal Iron," gives an interesting description of the process of manufacturing Berger's guaranteed rehammered charcoal iron. Each stage of manufacture is made clear by an appropriate illustration. To protect customers the manufacturer announces that each sheet of its galvanized iron, tin plate, corrugated roofing or siding which is made of this charcoal iron will be stamped with the registered trade mark, "Berger's Guaranteed Rehammered Charcoal Iron," and each joint of eave trough or conductor pipe of the same material will bear a brass label carrying the same trade mark.

The Pratt & Letchworth Co., of Buffalo, in an attractive booklet of 23 pages, 6¼ x 8¼ in., gives photographs of representative types of engines used on various railroad systems, the steel castings on all the locomotives shown having been manufactured in the company's steel foundry at Buffalo. The types illustrated range from those designed for high-speed passenger service to the heaviest and most powerful built, represented by the articulated type employed by the Baltimore & Ohio Railroad Co., the rear engine containing the high pressure cylinders and the forward one the low pressure. A view is also given of the Buffalo plant of the Pratt & Letchworth Co., with its well-kept yard and its street lined with shade trees.

A neat folder tells of the oil cabinets made by S. F. Bowser & Co., Inc. of Ft. Wayne, Ind. Only a few of the 50 different styles can be shown in the limited space available but these appear to good advantage even with that handicap. The handling of oil is a live question in manufacturing plants and the sloppy method in which it is often supplied to the men has doubtless much to do with carelessness in its after use. The one naturally leads by easy paths to the other. There is the serious side of oil handling negligence in danger from fire and the clean and convenient cabinet is an insurance against sundry shop evils.

Catalogue No. 30 deals with the pulverizing machinery of the Jeffrey Mfg. Co., of Columbus, O. The firm has recently purchased the patents and good will of the Schoellhorn-Albrecht Machine Co. covering its crushing machinery. One of this type of machine, the swing hammer, was recently described in *The Iron Trade Review*. The machines are made in considerable variety and the screens, beaters, etc. are freely illustrated.

The C. O. Bartlett & Snow Co., of Cleveland, has a special gear catalogue listing spur, bevel, miter, angle and worm gears. The numbering of the gears is a matter of quite general interest and is here given. Each number denotes the pitch, teeth and face of the respective gears as follows: The first three numbers designate the pitch, the next three the number of teeth, and the last two the face. As the face of the gears ordinarily vary by ⅛ in., dividing the last two numbers by 8 will give the face of the gear. Thus No. 11212524 stands for the following 112 = 1½ in. pitch, 125 = 125 teeth, and 24 ÷ 8 = 3 in., width of face.

Another loose page for the office binder of the Gisholt Machine Co., of Madison, Wis., gives a very good idea of the exhibit which was awarded the Grand Prize at St. Louis. The exhibit comprised machines of all the types now manufactured by this company, including several sizes of standard turret lathes, the big bore lathe for large bar work, several sizes of vertical boring mills, a horizontal boring mill and a universal tool grinder. Most of the machines were arranged with direct connected motors, though a few arranged for belt drive were also shown.

New Railway Equipment.

Among the orders for new cars recently given are the following: Michigan Central, 2,300 cars of the American Car & Foundry Co.; Northern Pacific, 500 cars of the Pressed Steel Car Co. The Delaware, Susquehanna & Schuylkill has asked for bids on 1,000 50-ton coal cars. Nelson, Morris & Co. have ordered material for 100 refrigerator cars to be built at their own shops. The Norfolk & Western is assembling materials for the erection at its own shops of 400 hopper-bottom gondolas and 25 cabin cars. The Cincinnati, New Orleans & Texas Pacific has ordered 200 drop-bottom coke cars of the Western Steel Car & Foundry Co.

The Delaware & Hudson has ordered 15 locomotives of the American Locomotive Co.; the Mobile, Jackson & Kansas City, three of the Baldwin Locomotive Works; Toledo, St. Louis & Western, 10 of the American Locomotive Co., in addition to the 10 previously reported; the Cincinnati, Hamilton & Dayton has ordered 40 locomotives of the Baldwin Locomotive Co.; Michigan Central, 34 of the American Locomotive Co.; Bessemer & Lake Erie, 10 of the American Locomotive Co.

Complete adjustment of the fire losses from the recent fire at the Day-Ward Co.'s plant at Warren, O., shows the damage to have been $7,000, and the insurance about $5,000 The company has secured a lease of the Sennett foundry at Youngstown, O., and will use this until its new foundries are completed. The Sennett plant has been closed down for some time.

The Travelers' and Merchants' Association, of Baltimore, has decided to recommend the erection of a monument of scrap metal taken from the ruins of the great Baltimore fire. The monument will be located as near as possible the place of origin of the fire. The plan is to get, through purchase and donation, the material of which the monument is to be made, and offer a prize for competitive designs.

George W. Funk has been appointed receiver of the Miskimen Furnace Co., Logansport, Ind., on petition of President Graas, of the company. It was embarrassed by the recent disappearance of County Treasurer Obenchain, who is also treasurer of the company.

FOREIGN IRON AND STEEL NOTES.

The Springfield Locomotive Works of Darlington, Eng., recently secured the following contracts: Ten passenger and ten freight locomotives for the Bengal Nagpur railway, several "decapod" freight engines for the Great Western Railway of Argentina and ten passenger locomotives, with six-wheeled tenders, for the Shanghai-Nankin railway.

The Sheffield correspondent of the *Iron and Steel Trades Journal*, says: "Although there is little or no improvement in the demand for crucible steel for consumption at home, some houses are doing much better with a few foreign markets. The consignments going out to Japan both of steel and heavy tools are unusually heavy, and the orders on hand will keep them fully employed for some time to come. Other firms are sending increasing quantities of the very best steels to America, and of ordinary brands to China and one or two of our colonies. The South African market is developing very slowly, and it is remarked that the steel in request is of a lower grade than was the case before the war. There was a period when the mines paid a good price for their steel, but they are taking less high-class qualities, and more of Bessemer and Siemens steels. Trade with Continental markets, especially with Russia, is only quiet."

The first annual financial report of the Fried, Krupp Co., Essen, Germany, shows a net profit for the year of 20,162,784 marks, out of which 5 percent was set aside for reserve, according to law, an additional 600,000 marks for special reserve and 500,000 for the workmen's pension fund. A dividend of 6 percent was declared on the capital of 160,000,000 marks. The property and plant are valued at 148,435,146 marks.

The London *Ironmonger* has the following which will be of interest in the United States: "Competition in the Sheffield file trade is exceedingly keen just now, and makers are extending their discounts off the standard list. The underselling was started by the United States firms, and in order to get a share of the limited business which is available, some of their Sheffield rivals have felt it necessary to offer the same prices. * * * There is reason to suppose that the United States will shortly make a bid for a share of the trade in high-speed twist-drills—Sheffield's newest industry—as firms in that country have been making inquiries among Sheffield steelmakers with respect to a supply of steel suitable for drills. It will certainly be a feather in the cap of Sheffield if—as seems likely—the Americans find it necessary to use her steel for their drills, and seeing that such material would have to carry a duty of about 40 percent in addition to cost of freight, Sheffield ought to have no difficulty in holding the export trade in the finished tools. Although high-speed steel is being made in the United States, it appears that the bulk of the material used comes from Sheffield, or is being supplied by Sheffield firms having furnaces in the United States. We have heard it stated that the high-speed drills are not in some cases successfully standing the severe strains to which they are subjected, but, even if there is a considerable proportion of failures, the tools are giving satisfaction on the whole, and the output of them is increasing. It is doubtless true that some brands of steel have not answered very well in the form of drills, and the makers are altering the proportions of the ingredients in order to remedy the defects."

Judging Steel by Emery Wheel Sparks.

The October issue of the *Revue de Métallurgie* describes a novel investigation. The author, M. Demozay, has experimented with various steels applied to an emery wheel and points out that to the trained eye there are marked differences in the sparks emitted. It would appear that careful comparison will show a distinction created by forging, etc., but annealing does not seem to make any difference in the character of the sparks as reported by the author, a conclusion by the way that will be of interest to shop men. An examination of special steels shows characteristic sparks peculiar to chromium, nickel, manganese, etc.

A Large Eye-Bar.

One of the largest eye-bars ever made was forged recently at the shops of the Phoenix Bridge Co. and broken in its 1,200-ton testing machine. Bars of this size will be used in the 1,800-ft. cantilever bridge over the St. Lawrence river at Quebec, which is now being fabricated in the shops at Phoenixville, Pa. This bar is 16 in. by 2 in.; the eye 36 in. in diameter, the pin hole 14 in. in diameter. In testing the bar developed an ultimate strength of 52,450 lb. per sq. in., and 30,650 lb. per sq. in. elastic limit. The elongation in 7 ft. was 22.3 percent; the elongation of the pin hole 6.80 in.; the reduction of the area at the fracture, 43.1 percent. The bar broke in the body, and showed about 50 percent silky fracture.

Lake Superior Corporation Affairs.

Creditors of the Algoma Steel Co., Algoma Commercial Co. and the Sault Ste. Marie Pulp & Paper Co., all of Sault Ste. Marie, Ont., have again applied to have these concerns placed in the hands of receivers. The companies are subsidiary concerns of the Lake Superior Corporation, and as recent reports indicate that they are making money, it is not probable that the application will succeed. It is charged that some of the creditors who have been willing to settle have been prevented by lawyers who desire to prevent an adjustment of the debts.

The executive committee of the Lake Superior Corporation is looking forward to being able to pay off a large portion of the $2,000,000 loan made it by the Ontario government by the middle of next year. Provision is being made to have a certain portion of the profits each month set aside for this purpose and if present conditions continue, some of the members of the executive committee say it will be wiped out within a year.

Vice President Drummond, of the corporation, sales agent for the Algoma Steel Co., says that now that the Canadian railways have come into the market for steel rails there will be a market for 100,000 tons in 1905, and then, owing to the construction of the Grand Trunk Pacific, this would be increased to between 200,000 and 300,000 in 1906 and would remain at these figures for about five years at least. The Soo mill is expected to secure almost all the business for 1905.

Max Solomon, Pittsburg, dealer in old material, has purchased 21 acres of land at Carnegie, Pa., where his old material yard is now located. At this place he operates one of the best equipped yards in this vicinity and will greatly enlarge it with his new acquisitions.

Claiming that the C. W. Evans Steel & Iron Co., Cincinnati, is no longer a paying concern and that it has lost $6,000 the last year, G. C. Dom and H. C. Dom, stockholders, have filed a petition asking for the dissolution of the corporation, and the appointment of a receiver. The company's assets are $30,877 and liabilities, $10,115.

A suit for $250,000 damages has been filed in the United States Superior Court at Pittsburg by the American Sheet & Tin Plate Co. against the Pittsburg & Lake Erie railroad. Last January the plant of the plaintiff, located at the foot of South Sixteenth street, was destroyed by fire. It is alleged that a train belonging to the defendant was allowed to stand between the fire companies and the burning plant and prevented the firemen from getting to the fire in time to put it out.

LAKE ERIE ORE RECEIPTS 17,794,598 TONS.

In spite of the late opening of the season of navigation this year, more ore was received at Lake Erie docks than in 1901 or any preceding year and only 1,887,133 tons less than in 1903. The receipts this year were 17,794,598 tons. The ore on docks Dec. 1, 1904, was 5,669,895 tons, which is less than any year since 1899, when 5,530,283 tons were in docks. Last year, Cleveland led in ore receipts, with Ashtabula a close second and Conneaut third. This year, Conneaut exceeds Cleveland by 649,643 tons and Ashtabula by 444,405. So Conneaut leads with Ashtabula second and Cleveland third. The following table gives receipts at Lake Erie ports, and ore on docks for the years named:

IRON ORE RECEIPTS AT LAKE ERIE PORTS, GROSS TONS

Ports	1904	1903	1902	1901	1900
Toledo	508,793	652,305	1,037,571	798,298	645,147
Sandusky	48,356	130,532	165,556	33,017	154,542
Huron	231,364	486,106	520,646	431,311	321,914
Lorain	972,931	900,490	1,442,417	721,662	1,090,235
Cleveland	3,434,012	4,434,160	4,873,318	3,831,060	3,376,644
Fairport	1,157,858	1,434,342	1,538,744	1,181,776	1,085,554
Ashtabula	3,639,250	4,242,160	4,796,805	3,981,170	3,709,486
Conneaut	4,083,655	3,903,937	4,300,301	3,181,019	2,556,631
Erie	1,284,778	1,257,798	1,717,268	1,379,377	1,240,715
Buffalo & Tonawanda	1,665,917	2,149,901	2,256,798	1,475,386	1,616,919
Total	17,794,598	19,681,731	22,649,424	17,014,076	15,707,787

IRON ORE ON LAKE ERIE DOCKS, DEC. 1, GROSS TONS

Ports	1904	1903	1902	1901	1900
Toledo	318,573	106,710	310,023	254,196	242,375
Sandusky	75,134	95,275	95,175	47,384	95,111
Huron	182,495	253,249	232,764	231,501	211,377
Lorain	299,504	288,581	328,304	195,863	251,838
Cleveland	1,143,529	1,337,750	1,500,604	1,378,060	1,337,445
Fairport	660,420	845,946	924,236	710,590	611,717
Ashtabula	1,403,575	1,911,911	1,967,136	1,709,145	1,811,459
Conneaut	684,487	591,364	673,679	604,106	680,514
Erie	583,439	657,409	722,966	470,718	480,734
Buffalo	318,793	282,890	319,367	198,100	232,100
Total	5,669,895	6,371,085	7,074,254	5,859,663	5,904,670

Our statistics of last May showed 4,534,103 tons on Lake Erie docks at that time. Adding to this the receipts of the season just closed and subtracting the amount on dock Dec. 1, we have 16,658,806 tons as the shipments to furnaces in the season of navigation, including ore unloaded directly upon furnace docks, as against 16,903,013 in the corresponding period of 1903, a decrease of only 244,207 tons, showing that a much larger percentage of the receipts went direct to the stacks than last year, the percentage being 93 this year, 86 last year, and 81 in 1902.

The shipments of iron ore by water from the Lake Superior region for 1904 were 21,226,591 tons. The following table shows the shipments for five years:

	1904	1903	1902	1901	1900
Escanaba	3,644,267	4,277,561	5,413,704	4,022,668	3,436,734
Marquette	1,907,301	2,007,346	2,595,010	2,354,284	2,661,861
Ashland	2,288,400	2,823,119	3,553,919	2,896,252	2,633,687
Two Harbors	4,566,542	5,120,656	5,605,185	5,018,197	4,007,294
Gladstone	553	35,816	92,375	117,089	418,854
Superior	4,169,990	3,978,579	4,180,568	2,321,077	1,522,899
Duluth	4,649,611	5,356,473	5,598 408	3,437,355	3,888,986
Total, by lake	21,226,664	23,649,550	27,039,169	20,157,522	18,570,315
Total, all rail	.....	640 328	531,952	436,015	489,078
Total shipments	.....	24,289,878	27,571,121	20,593,537	19,059,393

The table does not include 76,606 tons shipped to Lake Erie ports from the Lake Superior Corporation's Helen mine in Canada on the Michipicoten range, nor does it include shipments from the Baraboo range nor rail shipments for this year.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants:—

The Davenport Wagon Co is being organized at Davenport, Ia., and will have a capital of $200,000. The company will manufacture a steel wheel wagon with body largely of steel.

The Marine Boiler Works Co., Toledo, O., has been incorporated with a capital of $125,000. Incorporators are: Richard Reeves, C. A. Leeper, H. W. Leeper, D. C. Shaw and Charles R. Clapp.

The Maryland Car Wheel Mfg. Co., Cumberland, Md., has been incorporated with a capital of $25,000 to manufacture a self-lubricating car wheel invented by John Duroth; also various kinds of cars and mining supplies.

The Virginia Stove & Mfg. Co., Basic City, Va., has been incorporated with a capital of $30,000 to manufacture stoves. The company requests catalogues of foundry equipment and supplies, except boiler, engine and cupola.

The Wilmot Machinery Co., New Orleans, La., has been incorporated with a capital of $20,000.

The Wedge Hoisting & Conveying Machinery Co., Cleveland, O., has been incorporated with a capital of $20,000. Incorporators are: F. W. Wedge, F. H. Ewing, G. D. Wright, T. J. McManus and F. W. Scott.

The C. J. Johnson Mfg. Co., St. Paul, Minn., has been incorporated with a capital of $30,000. Incorporators are: Charles J. Johnson, Charles Johnson and W. T. Johnson.

The Aurora Light & Stove Works, Aurora, Ill., have been incorporated with a capital of $10,000. Incorporators are: K. C. Loehr, M. B. Rich and R. F. Potter.

The Railway Equipment Co. has been organized at Encampment, Wyo., to manufacture the device invented by N. B. Young of that city, to prevent collisions between trains. The company has an authorized capital of $2,000,000 and it is proposed to interest railway companies in the invention by making practical tests and demonstrating the working of the device. The device consists of automatically operating rods which throw up lugs in front and behind a moving train, so that if another train is approaching from either direction these lugs will connect with rods on the approaching train and automatically set the air on both trains.

The Hoagland-Barrett Mfg. Co., Indianapolis, Ind., has been incorporated with a capital of $60,000. The officers are: President, Thomas Barrett; vice president, D. W. Bolin; secretary, J. T. Markey; treasurer, E. H. Thayer; general manager, Israel Hoagland. The company will manufacture a check valve, which is an invention intended to check the flow of water used for domestic and elevator purposes when high pressure is on.

The Trenton Hardware Mfg. Co., whose plant was recently destroyed by fire, has leased a building on Perrine avenue, Trenton, N. J., which it will equip for the manufacture of light castings. The company is in the market for tumbling barrels, molders ,etc., and would like to receive catalogues relating to that kind of equipment.

New Construction:—

It has been officially announced that the new shops, which the Detroit Southern Railroad intends to build at a cost of $60,000, will be located in Jackson, O.

The Winkler Bros. Mfg. Co., South Bend, Ind., is planning the erection of a large factory to meet the requirements of its increasing business. The main building will be 350x70 ft., five stories.

At an early date, under the direction of Bridge Commissioner Best, of New York, plans will be prepared for the proposed Hendrik Hudson Memorial Bridge over the Harlem

River from Inwood to Spuyten Duyvil. The bridge will cost about $2,500,000.

The Delphi Machine Co., Delphi, Ind., will build a new machine shop which it expects to have in operation about April 15.

Bartz, Wygant & Brown, Hornellsville, N. Y., will erect an iron and brass foundry to supply their works with castings. Machinery for the foundry has been purchased.

The Elliott & Reid Co., Richmond, Ind., manufacturer of Royal steel spring fencing, has decided to erect additions which will increase the capacity of the plant 50 per cent.

The American Brass Novelty Co., Grand Haven, Mich., has purchased the business of the Cream City Mfg. Co., Milwaukee, Wis. It will manufacture the locks heretofore manufactured by the latter company.

The National Gear Shield Co., Columbus, O., has broken ground for an addition 25x50 feet, to be used as a warehouse.

The Iron Co. of America, Roanoke, Va., has remodeled its rolling mill, which is about ready for operation. The new machine shop, 30x30 ft., and the building over the furnace and gas producer are nearly finished and it is expected the company will be able to put the entire plant in operation early in January.

The Livingston Mfg. Co., Camden, Me., manufacturer of stone cutting machines, will build an addition which will probably be 60x100 feet, to be used as a forge room and machine shop building.

George Castner will build a plant at Syracuse, N. Y., for the manufacture of steel signs. The building and equipment will cost $5,000. The building will be of brick 40 x 100 ft., two stories.

The opening of the year 1905 will mark the practical completion of the Leyner Machine Shops & Engineering plant at Littleton Col. The six large buildings have been placed under roof and the interior work is nearly finished. The buildings are all of stone and steel and are perfectly equipped for the manufacture of mining machinery. In addition to these six buildings, the company will erect a warehouse, 75 x 200 ft. About 200 men will be employed in the plant.

Severance & Boughton, proprietors of machine shops at Walla Walla, Wash., have just completed an addition to their plant. Some new machinery has been installed. William Meyer has constructed a foundry upon land leased of the company and is building a pattern shop.

Jugo Jacobson, of Paris, who has been in this country for some time representing Le Campaigne Generale Des Products Metallurgines de France, is said to be seeking a location for a steel plant. He is quoted as saying that he has three possible cities in mind, Toronto, Cleveland and a city in Indiana or on the northern border located on Lake Michigan.

The Waite Gas Engine Co., owner of the American and foreign patents on the new Waite engine, will build a plant at Milwaukee.

A force of 200 men is now at work pushing the line of the Alaska Central railroad from Seward, Alaska, toward the Tanana river. A machine shop will be built at Seward this winter. Master Mechanic G. W. Gabriel is in Seattle buying machinery for the shop and it will be shipped north at once.

The directors of the Connellsville Mfg. & Mine Supply Co., Connellsville, Pa. have voted an expenditure of $50,000 for the shops at Newhaven, Pa. The improvements contemplated for the Newhaven shops are a new construction house where the mine fans and other machinery are made, and a three story steel and concrete storage house for patterns. A steel extension for the electric crane will run 80 ft. to the north of the foundry and 150 ft. south of the new machine shop for the crane there.

The Erie City Iron Works Erie, Pa., has increased its capital from $1,000,000 to $2,000,000. The company is now building a large addition to its boiler shops and contemplates some other changes during the year, for which plans have not yet been completed. The company states that its outlook for trade is very encouraging and that it is expecting a large business during 1905.

W. C. Mitchell and others contemplate erecting general machine and boiler shops at Carbondale, Ill. An effort is being made to obtain assistance from the city.

The Minneapolis & St. Louis railroad will establish shops somewhere on its recently acquired Des Moines & Ft. Dodge line to take care of the repair work of the division. The location has not yet been determined.

The Singer Mfg. Co. has acquired the land and buildings formerly occupied by the Henry R. Worthington Pump Works at Elizabeth, N. J. The company has requested the council to vacate a street, as the company desires it for the enlargement of its works, but it advises us that it is not at present making additions to its plant.

The J. V. Newlin Mfg. Co., Sebring, O., has completed the erection of its foundry and expects to build a machine shop in the spring. The foundry is 60 x 80 ft. and the machine shop will be of similar size.

The Hart & Cooley Co., New Britain, Conn., manufacturer of registers, is building an addition 52 x 100 ft., two stories.

Miller, Hall & Son, Chicago, manufacturers of metal beds, have leased land at West Taylor street and Campbell avenue and will erect a manufacturing building.

Fires and Accidents :—

Fire at the Conner Foundry, Bloomsburg, Pa., recently ruined the interior of the plant. Loss about $5,000, covered by insurance.

The plant of John Thompson & Sons, Beloit, Wis., manufacturers of agricultural machinery and gasoline engines, was destroyed by fire Dec. 20. Loss $1,000.

Fire in the plant of the St. Louis Steam Engine & Machine Works, St. Louis, Mo., Dec. 21, caused a loss of $7,000.

The fire which destroyed the annex of the Bradley Car Co.'s plant, Worcester, Mass., Dec. 19, caused a loss estimated at $10,000.

General Industrial Notes :—

The American Rolling Mill Co. is now considering whether it will continue the operation of its plant at Muncie, Ind., or move it to Chicago. The furnaces and boilers are being taken down and when the plant resumes coal will be substituted in the place of gas as a fuel. An appeal has been made to the people of Muncie to subscribe for $25,000 worth of treasury stock, but there does not seem to be much prospect that the stock will be taken.

At the meeting of the Eastern Bar Iron Association, held in New York last Thursday, it was decided to advance the prices of its product $2.00 per ton. The manufacturers of bolts and nuts, at a meeting in New York, decided on an advance in prices amounting to 5 per cent.

The Fischer Foundry & Machine Co., which builds rolling mill, glass works and general machinery, has contracted with Badische Maschinen-Fabrik, Durlach, Baden, Germany, for a complete outfit for making specially high grade steel castings by the Raapke process. The plant will be installed at the foundry and machine works of the company in Pittsburg or at its new works at Ford City, Pa. The Raapke process is in successful operation in Germany and France.

The Auer Register Co., Toledo, O., manufacturer of ventilating registers, radiators and small cook stoves, will resume its plant to Delphos, O., where new buildings are being erected.

The Keasey Pulley Co., Toledo, O., has purchased the plant and business of the Wales Pulley Co., Swanton, O., and will remove the plant to Toledo after Feb. 1. The Keasey Co is erecting a plant near Toledo.

For the next two months at least, the plant of the American Locomotive Co. at Schenectady, N. Y. will be run at its full capacity and by the first of March 160 locomotives will

be turned out. Men are constantly being added to the force and the outlook for next year's work is very encouraging.

The Hassell Iron Works Co., Colorado Springs, Colo., has been awarded the contract for furnishing 150 tons of structural steel for the sugar plant being erected at Lamar, Colo. by the American Beet Sugar Co.

George Wenger has purchased a building 50 x 120 ft. at 1320 Merchant street, St. Louis, which will be converted into a machine shop.

The Howard-Bullough Machine Co., Pawtucket, R. I., one of the largest plants for the manufacture of cotton machinery in the country, resumed work according to the old schedule last Monday. For more than a year the plant has been running for only 45 hours a week.

The Bass Foundry & Machine Works, Ft. Wayne, Ind., have found its necessary to increase the size of its foundry on account of the heavy demand for castings. The number of molders has been increased.

The blast furnace at Newberry, Mich., owned by the Michigan Iron Co., which was blown out in July, will be in blast about Jan. 15. During the shut down, the furnace has been thoroughly overhauled and numerous improvements made. The company has installed a Weimer blowing engine. The stack has been relined and a 20-ft. addition built to the casting house. It is expected that the chemical plant will be in operation by Jan. 1. The Michigan Iron Co. is operating wood camps north of Newberry which employ about 400 men.

The Clark Machine Co., Utica, N. Y., recently incorporated, intends to take on the business of Clark & Co., successors to Rumsey-Williams Co., St. Johnsville, N. Y. The plant manufactures threshing machines, gasoline and steam engines and will not be enlarged, as it is ample for all requirements.

Since the blowing in of the blast furnace at Bristol, Tenn., every furnace in Southwestern Virginia and East Tennessee is at work. The entire chain of furnaces from Roanoke to Tennessee now controlled by the Virginia Iron, Coal & Coke Co. is working a full quota of men. A number of these furnaces had been closed throughout the summer and autumn months.

G. D. Berry, of the Berry Foundry & Machine Co., St. Joseph, Mo., has closed a contract with the Chicago, Rock Island & Pacific Railroad Co. to do the casting work of the company for the territory west of the Missouri river. The contract will amount to about $100,000 a year.

The National Spiral Fire Escape Co., Amherst, Mass., recently incorporated, will have the sections of the escapes manufactured at or near the site of erection. This plan, for the present at least, will enable the company to save the investment of capital in plant.

The American Gas Saving & Heating Co., Lowell, Mass., recently incorporated with a capital of $15,000, will manufacture an automatic gas governor and other gas appliances. For the present the company's specialties will be manufactured by contract, but it is expected that in time a plant will be erected.

R. L. Wood and F. J. Wood have taken over the entire interest of the Wood Bros. Steel Self Feeder Co., Des Moines, Ia., paying $50,000 for the 100 shares of stock which they did not own. The new officers are: F. J. Wood, president; R. L. Wood, secretary and treasurer; E. E. Wood, vice president, and R. J. Wood, assistant secretary.

The Beaver tin plate plant of the American Sheet & Tin Plate Co., Lisbon, O., has been sold to Berthold Goldsmith, formerly district superintendent of the Valley plants of the sheet and tin plate consolidation. The mill contains seven mills and will be used for rolling sheet copper.

The Thomas D. West Foundry Co., Sharpsville, Pa., has been incorporated with $50,000 capital. George H. Boyd, I. W. Boyd and Thos. D. West are the incorporators. The company operates a large foundry for the production of ingot molds.

The Continental Can Co., recently incorporated, has purchased the property known as the Glass Works, Syracuse, N. Y., and will begin the manufacture of cans in a few weeks, employing about 600 men.

The Bristol furnace of the Virginia Iron, Coal & Coke Co., at Bristol, Tenn., has been blown in.

The new plant of the Ohio Steel Foundry Co., Paden City, W. Va., will be put in operation shortly after January 1. The plant contains three not sheet mills and two open-hearth furnaces are being built. Natural gas is used for fuel.

Increased activity is manifest at the Detroit plants of the American Car & Foundry Co. For nearly a year the forge department was practically closed. It is now employing 500 men. The Michigan plant at Michigan and Clark avenues is utilized for repairs to rolling stock. Very little work has been done during the year, but it is now running with upwards of 1,800 men employed. The Peninsular plant is in operation with nearly 2,500 men at work.

Dr. C. B. Forward of Cleveland, vice president and general manager of the Eclipse Railway Supply Co. of that city, which manufactures fenders or life guards and other specialties, recently visited Kansas City, Mo., to which city he contemplates moving the plant. Definite decision in the matter will probably not be reached for some time.

The Waterloo Mfg. Co., Waterloo, Ia., manufacturer of sheet metal work, has leased a building for a term of years and expects to increase its manufacturing business. It now has a number of good contracts on hand.

The Heggie Boiler Co., Joliet, Ill., will soon begin remodeling and rebuilding locomotives.

The fire damage recently done to the Riverside Bridge Works, Martin's Ferry, O., has been repaired. The destruction of the power plant caused an enforced idleness of several weeks.

As a result of the resignation of Berthold Goldsmith, one of the district managers of the American Sheet & Tin Plate Co., Pittsburg, there has been a general redistricting of the tin mills of that company. His mills are partly distributed among other district managers and partly given to T. C. Stevenson, now superintendent of the LaBelle tin mill at Wheeling, W. Va. Mr. Stevenson will have the Crescent mill at Cleveland, O., the Falcon, at Niles, O., the Chester, W. Va., mill and one or two others. The Sharon, Pa., mill is given to George Greer, in charge of the New Castle mills. The Star mill at Pittsburg and the two New Kensington mills are given J. R. Phillips, who is relieved of the Humbert mill at Connellsville, this mill being placed in charge of Robert Skemp, manager of the two sheet mills at Scottdale, Pa.

The Utica Drop Forge & Tool Co., Utica, N. Y., has elected the following directors for the ensuing year: W. Pierrepont White, H. Lawrence White, John P. Campbell, Frederick S. Kellogg and Harry F. Kelleman. The following officers for the year were elected: President, W. Pierrepont White; vice president, John P. Campbell; secretary and treasurer, Hugh White.

The plant of the Iron & Steel Co., of Canada, located at Belleville, Ont., was offered for sale recently, but as only two bids—one of $25,000, made by M. Sessenwein, of Montreal and another of $50,000, made by H. Corby, of Belleville, were received, the Master in Chancery declined to make the sale.

The contract for building the foundation and the steel structure for the National Theatre in Mexico City has been awarded by the Government to the firm of Milliken Bros., 11 Broadway, New York. Work will be commenced in about two months. The cost of the foundation and the erection of the steel frame work will amount to about $1,500,000 in Mexican money.

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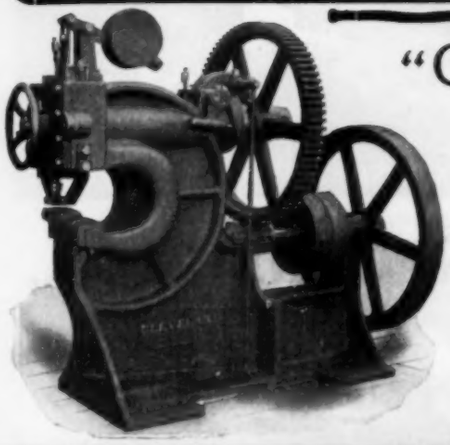

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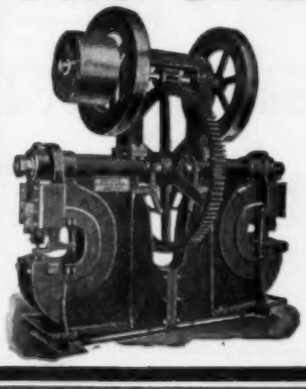

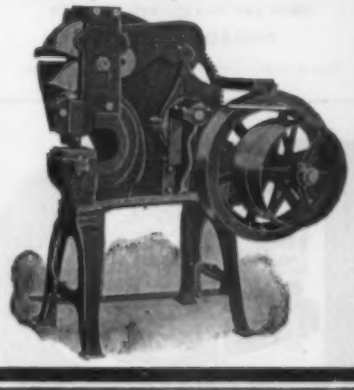

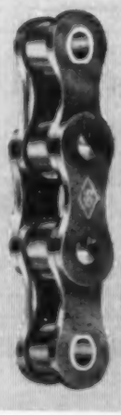

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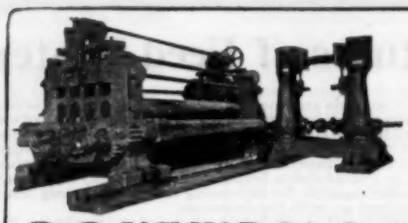

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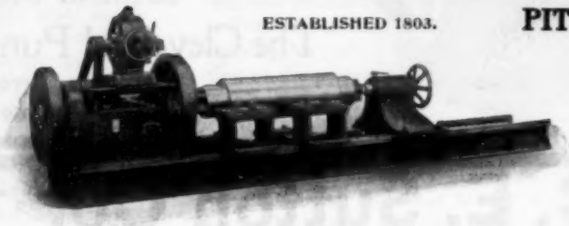

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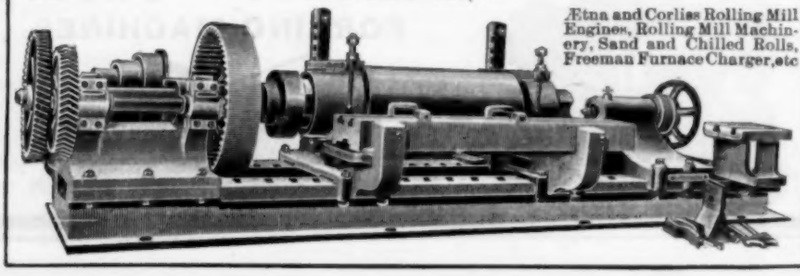

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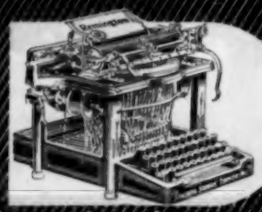

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